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J952-48

ENERGY EFFICIENCY OF BUILDINGS IN CITIES

Volume II: Working Papers

Paper No. 1: Fostering Equity in Urban Conservation: Utility Metering and Utility Financing
- Part 1: Utility Metering
- Part 2: Utility Financing

Paper No. 2: Case Studies of Building Energy Efficiency in Five U.S. Cities
- Buffalo
- Des Moines
- Jersey City
- San Antonio
- Tampa

December 1982

CONGRESS OF THE UNITED STATES
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Preface

This volume contains papers written for OTA to assist in preparation of the report *Energy Efficiency of Buildings in Cities.* OTA does not endorse these papers. In several instances, the OTA report reaches somewhat different conclusions because of additional information which was obtained later. These papers, however, may prove valuable for readers needing more detailed or specific information than could be accommodated in the final assessment report, and are being made available for such purposes.

Working Paper No. 1:

FOSTERING EQUITY IN URBAN CONSERVATION
UTILITY METERING
AND
UTILITY FINANCING

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Office of Technology Assessment

January 1981

FOSTERING EQUITY IN URBAN CONSERVATION: UTILITY METERING AND UTILITY FINANCING

Prepared for

United States Congress
Office of Technology Assessment

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PART I: UTILITY METERING

I. The Meter is the Message

The methods by which energy usage in multifamily rental housing is metered has not been the object of great attention in the design of energy policy. However, utility metering of rental housing is one of the most critical, if misunderstood, determinants of energy use and conservation in urban housing. Type of metering alone determines whether the owner or renter receives economic price signals resulting from utility consumption, what structure of utility rates apply, conditions of utility service and even eligibility for a host of federal benefits. The type of metering system employed in urban housing influences the choice of heating energy utilized, the prospects for eventual adaptation to decentralized renewable energy technologies and the likely success of achieving energy conservation. Despite its obscure posture in the energy debate, the meter is the message.

There are an estimated 20 million multifamily (two or more units per building) dwellings in the nation, representing more than one-quarter of the total stock,[1] as illustrated in Table 1. About 14% of the multifamily dwellings are owner-occupied, while 86% (about 17 million) are rented.[2] Rented dwellings constitute more than one-third of the total housing stock.[3] Of these 26 million rented units, two-thirds are multifamily in design; with fully 40% of the multifamily dwellings in units of 10 or more per building.[4]

Table 1

TOTAL OCCUPIED HOUSING UNITS, 1975
BY TENURE AND TYPE OF STRUCTURE
(Rental Only)

RENTER OCCUPIED HOUSING UNITS[1]	NUMBER OF UNITS (In 000's)	PERCENT OF TOTAL UNITS	PERCENT OF RENTAL UNITS
Size of Structure[2]			
Mobile Home	519	0.7	2.0
Detached 1 Unit	7,082	9.8	27.6
Attached 1 Unit	1,350	1.9	5.3
Total 1 Unit	8,951	12.4	34.9
2-4 Units	6,772	9.4	26.4
5-9 Units	3,028	4.2	11.8
10-19 Units	2,514	3.5	9.8
20-49 Units	2,058	2.8	8.0
50 or More	2,332	3.2	9.1
	25,656	35.4	100.0
UNITS BY TENURE			
Total Renter-Occupied Housing Units	25,656	35.4%	100.0%
Owner-Occupied Housing Units	46,867	64.6	
Total Occupied Housing Units	72,523	100.0%	

Source: RUPI, Federal Incentives for Solar Homes, 1977 at VII-4.

Almost without exception, single-family units are individually metered for energy service supplied from central sources.[5] Multifamily units are metered by the utility supplier with individual or master metering systems. Samples suggest that for electricity service about 20% of multifamily rental units are master metered while 80% are individually metered.[6] For heating fuels, about 58% are master metered while 42% are individually metered.[7] The heating sources employed in multifamily rental units are approximately 50% natural gas, 25% fuel oil (predominately in buildings of more than 4 units), and 20% electricity (principally in larger buildings).[8]

Although there is not detailed reliable data for urban regions, two aspects of housing development patterns underscore the significance of this data for urban regions. First, especially in older urban areas, the share of rental housing greatly exceeds national average. For example in Boston, 73% of the dwelling stock is rented; while in New York City 71% is rented.[9] Second, historic land-use patterns have created a disproportionate share of the rental stock as multifamily (highrise) design. Together, these factors indicate that a large percentage of dwellings in many urban communities are master-metered centrally-heated multifamily rental units.

In the multifamily rental sector, utility service creates a naturally adversarial relationship between landlords and tenants. When utilities are master metered, landlords, as customers of the utilities, have an economic incentive for making conserving improvements to their buildings, while tenants receive no direct feedback on individual usage and are not individually responsible for utility costs. When rental units are individually metered, tenants, as the customers of the utilities, directly receive the pricing signals of their usage, while the owner experiences no direct economic incentives to undertake conserving capital improvements. Correspondingly, tenants have no legal ability nor long-term economic incentive to make significant capital investments in a rental unit, and in some situations (locked thermostats, special age or health related heat or energy needs) are unable to significantly reduce energy consumption in response to individually metered price signals.

Utility metering in multifamily housing poses very real policy trade-offs. It places on tenants or owners the incidence of economic price signals and incentives for conservation. Metering determines eligibility for several federal benefits. It creates barriers at the same time it creates incentives for conservation and renewable investments.[10] Moreover, metering choices have substantial equity implications for tenants. There is no perfect metering policy: Every option has important disbenefits for efficient use of energy in the urban environment.

Footnotes

[1] RUPI, Federal Incentives for Solar Homes, 1977, at VII-4.

[2] U.S. Department of Commerce, 1976 Annual Housing Survey, Table U-53-40. Since this time condominium conversion has become a significant factor in ownership of multifamily units. It is estimated that 42% of existing apartments are heated by master metered steam or hot water systems, while 7% use floor, wall or pipeless master metered furnaces.

[2] Booz, Allen & Hamilton, Alternative Metering Practices: Implications for Conservation in Multifamily Residences, 1979, at 11.

[3] 1976 Annual Housing Survey, supra.

[4] Id.

[5] The exception are units which generate their heat on-site or which are without any heating source.

[6] U.S. Dept. of Energy, Characteristics of the Housing Stock and Households, 1979, at Table 28.

[7] Id.; Midwest Research Institute, Energy Conservation Implications of Master Metering, Vol. I, 1975, at vii.

[8] 1976 Annual Housing Survey, supra., at Table U-53-54.

[9] Steven Ferrey, "But Some Won't Bask," in the New York Times, May 30, 1978.

[10] Steven Ferrey, "How Carter's Solar Program Could Eclipse the Cities," in Planning, December, 1978.

II. Multifamily Metering Options

Utility meter is the ugly duckling of conservation: it qualifies as neither of the two recognized generic conservation techniques. One generic type of conservation is the application of "technical fixes" -- insulation, storm windows, caulking, etc. While "technical fixes" involve real, and often significant cost, if properly installed they guarantee a certain energy efficiency saving without loss of comfort, regardless of who occupies the dwelling. The other type of conservation technique is a lifestyle change -- turning down the thermostat, using fewer lights, etc. Lifestyle changes usually are costless (and even save money), depend very much on the energy use patterns of the dwelling occupant, and often reduce perceived comfort.

An individual utility meter, as a means to allocate or shift the incidence of utility costs from owners to tenants, while widely regarded as a conservation measure, qualifies as neither type of generic conservation technique. In fact, it combines a curious combination of attributes. An individual meter by itself saves no energy; it merely measures it. It is totally dependent on motivating a personal lifestyle change to accomplish conservation. Yet, rather than being a costless technique, in many instances it is a very expensive device to install.[1] Unlike most other conservation "technical fixes," its potential for saving energy lies in lifestyle changes to reduce comfort, rather than in greater efficiency. Most notably, unlike all other "technical fixes" or conserving lifestyle changes, an individual meter in rental housing removes the economic market incentives for additional conserving capital improvements by owners.[2]

There are only three basic metering types for mutlifamily rental housing. A master utility meter serves an entire building, or series of units within a complex, with the building owner remaining the customer of the utility. There is no recordation of individual unit or common area usage; rental payments include utilities.

A submeter systems combines a master utility meter with a separate set of privately-owned and installed meters for each apartment.[3] The building owner remains the customer of the utility, while s/he can separately bill tenants for individual consumption. Individual utility meters utilize a separate utility company meter for each unit, with tenants and utility suppliers maintaining a direct relationship. Rent in an individually metered configuration only includes utility service for common areas of the building.

These three metering types can apply to different fuels and different metering configurations. Multifamily buildings can be supplied simultaneously by a variety of fuel sources. For example, a building could be supplied with electricity for lighting and related uses, solar thermal for domestic hot water needs, natural gas for back-up water heating and for cooking, and fuel oil for heating. Therefore it is possible for a unit to be mastermetered for one energy source, submetered for another and individually metered for yet another.

An important metering distinction occurs between energy used for heating purposes and electricity used for lighting and appliances. Commonly, electricity is delivered to the multifamily building at a voltage appropriate for immediate utilization by the consumer.[4] To the contrary, it is most common for heating energy to be delivered in a chemical form which must be converted to thermal energy.[5] This is accomplished by a combustion furnace which can take one of two forms in a multifamily structure: An individual furnace or a central boiler. The equipment, piping or ducting configurations required for either is quite distinct, and doesn't easily accommodate later retrofit to the alternative configuration.[6]

Individual furnaces serving a single unit are individually metered. Central boilers, supplying heat or domestic hot water to multifamily units, can not be individually metered.[7] Central boilers can be master metered, as is the overwhelmingly predominant practice. To submeter a central boiler requires an entirely different and more sophisticated meter, known as a flow or BTU meter. Since a central boiler supplies heat, rather than raw fuel, through a central distribution network, BTU submeters must measure accurately not only the quantity, but also the heat value, of energy being delivered to each apartment unit. Still undergoing refinements, BTU meters have so far proven too expensive[8] and not reliable enough to satisfy state standards for meter accuracy in residential application, as specified in Table 2.

This means, that as a practical matter in multifamily residential applications, every state requires a choice between master metered central hydronic or steam fossil-fired heating systems, or individual metering. These combinations of metering,

Table 2

COMMISSION STANDARDS FOR METERING ACCURACY AND HOW COMMISSIONS POLICE THOSE STANDARDS

State	Deviation permitted	Have own test equip.?	Months between recalibration of utility equip.	Require statistical sample field tests	State	Deviation permitted	Have own test equip.?	Months between recalibration of utility equip.	Require statistical sample field tests
Alabama	2.0%	No	3	Yes	Minnesota	1.0	No	US	US
Arizona	3.0	Yes	NP	Yes	Montana	2.0	No	NP	Yes
Arkansas	1.0	No	12+	Yes	New Jersey	2.0	Yes	NP	No
California	2.0	No	NP	No	New York	2.0	Yes	12	Yes
Colorado	2.0	Yes	NP	Yes	Ohio	3.0	No	NP	No
Connecticut	1.0	Yes	12	Yes	Oregon	2.0	No	NP	No
Delaware	4.0	No	24	Yes	Pennsylvania	2.0	Yes	NP	All
District Columbia	2.0	No	12	Yes	Rhode Island	2.0	No	NP	No
Florida	0.5	No	12	Yes	South Carolina	0.5	Yes	NP	Yes
Georgia	2.0	Yes	12	No	South Dakota	2.0	No	NP	No
Illinois	2.0	Yes	12	Yes	Texas	2.0	No	12	Yes
Indiana	2.0	No	12+	Yes	Utah	2.0	No	12	Yes
Iowa	2.0	No	12	No	Vermont	4.0	Yes	NP	No
Kansas	2.0	No	NP	All	Virginia	2.0	Yes	NP	Yes
Louisiana	3.0	No	NP	No	Washington	2.0	No	12+	Yes
Maryland	2.0	Yes	3	Yes	West Virginia	2.0	No	6	No
Michigan	2.0	Yes	12	All	Wisconsin	1.0	Yes	12	No

Notes: NP – no policy; US – policy under study; All – all meters tested periodically in field

SOURCE: From "Electrical Meter & Load Management Study" compiled for the Ohio Office of the Consumers' Counsel, William Spratley, director, 137 East State Street, Columbus, Ohio 43215.

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fuel source and system configurations are illustrated in Table 3. As a consequence of fossil fuel sources constituting the primary heating source in multifamily units,[9] and the superior total energy efficiencies of fossil over electric heating,[10] the majority of multifamily units master meter heat for space and water.[11] Much-needed data on metering by building types in urban environments is not available. Data disaggregating metering choices by fuel and building type, nature of tenancy and tenant income in selected urban regions would be most valuable for future analysis.

Table 3: Heating Sources, Furnace Types and Metering Configurations

Fuel Source	Form of Energy	Furnace Necessary	Furnace Type	Metering Configuration	Sub Meter
Natural gas, oil, kerosene	Chemical	yes	central —— or individual ——	master —— individual ——	BTU met only no
electricity	electrical	no*	—	individual or master	yes

*A few electrically-fired central boilers do exist in multifamily housing

Conventional gas and electric meters are quite inexpensive, with the cost of installation varying greatly depending on whether the installation occurs at the time of construction or as a later retrofit, and depending on necessary rewiring, repiping, venting and costs of complying with applicable local codes.[13] For retrofits to existing buildings, costs can be as much as $4,160 per unit to install individual meters and related heating systems in multifamily housing.[14] While costs vary widely, it is estimated that in new construction individual meter systems exceed the cost of master meters by $720 per unit,[15] and for retrofit are generally in the range of $100 - 1600;[16] with $1000 not atypical in urban areas.[17] Within this cost context, public policy must decide the role and relative priority of utility metering.

Footnotes

[1] Cost estimates are discussed infra. at Chapter IV.

[2] This assumes that the rental market, as in the majority of urban areas, experiences sufficient demand so that inefficient units do not receive a devalued rent on the market. See e.g. Steven Ferrey, "Building an Equitable Solar Future," in requested papers of the American Academy for the Advancement of Science, Annual Meeting, 1980.

[3] "Checkmetering" is used to distinguish a form of submetering in which the readings of the submeters are not actually used to bill tenants for their individual consumption, but used for informational purposes by the landlord or tenants. The terms "checkmetering" and submetering are generally used interchangeably to designate a situation in which private unofficial meters are utilized by the building owner.

[4] The most likely exception is electricity which is produced or cogenerated on-site. For a thorough analysis of this potential see OTA's report on Dispersed Electric Generating Sources, 1981.

[5] In cases where electric heating is used, it can be employed for individual resistance heating, to power a heat pump or to operate a central electric furnace. Some multifamily units, especially in New York, can purchase steam for direct use for heating or cogenerate heat as a byproduct of electric power production.

[6] The economics of central boilers are superior to individual furances in multifamily buildings, as discussed infra. at Chapter IV.

[7] The utility supplier is responsible for the quality and accurate quantity of fuel or electricity delivered through a utility meter. However, since utility suppliers cannot control or guarantee the heat output and distribution of a building's furnace, they cannot individually meter central boilers in multifamily units.

[8] Testimony of Phillip B. Layfield, before the Public Utilities Control Authority of the State of Connecticut, Docket No. 78-0718, November 3, 1978, at 43. It has been estimated that a BTU meter costs $800-1100, resulting in an installed cost of between $1300-7000 per unit. See Booz, Allen, supra., at II-12.

[9] Almost 80% of rental buildings heat with natural or bottled gas or liquid fuels. Oak Ridge National Laboratory, Residential Energy Use to the Year 2000, 1977. See also, 1976 Annual Housing Survey, Supra.

[10] This is discussed infra., at Chapter IV.

[11] Booz, Allen, supra., at III-41.

[12] For a discussion of various metering devices and their costs, see Layfield, supra., at 36-37.

[13] In addition to local health, safety and energy retrofit codes which can be activated by permits for substantial rehabilitation, converting to individual metering requires compliance with the Natural Gas Pipeline Safety Act of 1968, P.L. 90-481. This Act requires cathodic protection of gas lines against corrosion, as well as inspection of lines and written emergency plans. The Imperial Valley Coordinated Housing Authority in Brawley, California, has calculated that compliance with this Act for a 25 unit building would cost $11,325, or $453 per unit.

[14] This extreme value was estimated for housing units in Anchorage, Alaska, in 1977. Memorandum from R.L. Prescott, Director, Alaska Assisted Native Housing Division (HUD), to George Parker, HUD Alaska Area Office, March 21, 1977.

[15] Booz, Allen, supra., at IV-9.

[16] Id., at 13-14.

[17] Conversion costs for individual metering in 1977 were estimated to be $700/unit in New York City and in Clinton, Michigan; $1200/unit in Martins Ferry; $1700/unit in Minneapolis. Letter from J. Simon, New York City Housing Authority, to Sydney Schwartz, HUD, July 8, 1977; Letter from M.T. Kastanek, HUD, to Alice Shell, Clinton Michigan Housing Commission, August 24, 1977; Letter from Dale Knutson, Martins Ferry Housing Authority, to L.Watson, HUD, October 12, 1977; Utility Check Metering Feasibility, Minneapolis Low Rent Public Housing 2 (1977).

III. Government Metering Policy

A. Standards

Section 113(b) of the Public Utilities Regulatory Policies Act of 1978(PURPA), requires each covered regulated and non-regulated utility to consider by November 1980 the adoption of 5 standards for electric utilities.[1] One of these five standards encourages the individual metering of electricity in new multi-unit buildings where:

- There is more than one unit in such building,
- The occupant of each such unit has control over a portion of the electric energy used in such unit, and
- With respect to some portion of electric energy used in such units, the long run benefits exceed the costs of purchasing and installing separate meters in these buildings.[2]

The requirements of PURPA for state utility Commissions and non-regulated utilities are procedural rather than substantive. Each state or covered utility must consider the metering standard, determine whether it is "appropriate" to carry out the purposes of PURPA,[3] and then decide whether to implement the standard. While PURPA provides authority for a state or nonregulated utility to adopt the metering standard, adoption is wholly within the state's discretion even if it finds the standard "appropriate."[4] Moreover, the Act provides that if consideration of this standard commenced before the enactment of PURPA, it can be "grandfathered" as in compliance if the process "substantially conformed to such requirements."[5] Therefore, some jurisdictions and utilities can legally avoid a recent consideration of metering policy if they have considered it in the past.

The most recent data available indicates the progress to date. For regulated utilities, 44% had initiated consideration and only 13% had reached a determination. For non-regulated utilities, 20% had begun consideration and 10% had reached a determination. In total, only 27 regulated and 7 non-regulated utilities had adopted the electric metering standard.[6] More than 70% of these 34 utilities grandfathered a former determination rather than reconsider their meter policy.[7] Four electric utilities rejected the PURPA metering standard. This progress is illustrated in Table 4.

The evidence available suggests that the purposes of the PURPA metering standard, as well as prudent cost/benefit considerations, are not being adhered to by states and utilities. Despite the requirements of PURPA that individual metering be cost effective, none of the nonregulated, and less than one-quarter of the regulated, utilities adopting the standard had performed any benefit/cost analysis or determined relevant costs.[8] Despite the PURPA requirement for individual metering that a tenant have control over electric energy use in an individually metered unit, at least one California utility has ignored the requirement.[9] Moreover, despite the intention of PURPA to cover all classes of electric customers, approximatley two-thirds of the covered utilities have excluded commercial buildings;[10] thus effectively exempting multifamily rental dwellings. Many states and

Table 4

STATUS OF CONSIDERATION PROCESS FOR THE MASTER METERING STANDARD

	Status					
Type of Utility	Process Not Started	Process Started But No Determination Made	Determination Made to Adopt Standard	Standard Put into Effect	Standard Rejected	Total
Regulated Electric	139	77	0	27	4	247
Nonregulated Electric	55	7	0	7	0	69
Total	194	84	0	34	4	316

Source: U.S. Dept. of Energy, Annual Report to Congress: PURPA, DOE/RG 0034/2, May 1980 nonregulated utilities did not comply with PURPA procedural requirements for open public hearings.[11]

A variety of other federal authority promotes the installation of individual meters. Section 247 of the National Energy Conservaton Policy Act authorized, but never funded, $2 billion for secondary financing of conservation loans which may be used to convert to individual meters in multifamily housing.[12] The Military Construction Authorization Act of 1978, provides $70 million for conversion to individual meters in military family housing.[13] For Section 236 mortgage-insured moderate income housing,[14] and for exsiting public housing,[15] HUD devotes significant resources for the conversion to individual forms of metering.

At the state level, independently of PURPA, master metering policies have emerged:[16]

14% ban master metering for all fuels
14% ban master metering for electricity only
8% explicitly permit master metering
57% have no metering laws

This is displayed in Table 5.

Similarly, state regulatory policies have emerged regarding submetering. As Table 5 illustrates, fully 61% of regulatory authorities ban submetering because building owners would effectively become unregulated utilities if they resold power to tenants based on their private, unofficial submetering systems.[17] Therefore, in almost two-thirds of the jurisdictions, the choice must be made between individual metering of heat and more efficient master metered central heating systems.

Table 5

Utility Regulatory Authority Metering Policies

STATES	MASTER METERING POLICY	PERMIT SUBMETERING? YES/NO	ANY ONGOING METERING EXPERIMENTS? YES/NO	COMMENTS
ALABAMA	NO LAW	YES	NO	I-M MOST PREVALENT
ALASKA	NO LAW	NO LAW	NO	SUBMETERING USED IN BOAT MARINAS ONLY
ARIZONA	NO LAW[4]	YES	NO	I-M MOST PREVALENT: HEARINGS HELD
ARKANSAS	NO LAW	NO	NO	UTILITIES RETROFIT MOSTLY I-M
CALIFORNIA	M-M BANNED	YES[5]	YES	
COLORADO	NO LAW	NO	NO	INFORMAL POLICY AGAINST M-M
CONNECTICUT	NO LAW	YES	NO	HEARINGS TO BE HELD TO BAN M-M
DELAWARE	NO LAW	LIMITED	NO	PSC CAN PROHIBIT S-M
WASH. DC	M-M ALLOWED	NO	YES	STUDY IS IN CONJUNCTION WITH PEPCO
FLORIDA	M-M BANNED	NO	YES	
GEORGIA	NO LAW	YES	NO	UTILITIES HAVE DECIDED TO BAN M-M
HAWAII	NO LAW YET	NO	NO	IN THE PROCESS OF COMPLETING GENERIC HEARINGS ON M-M
IDAHO	NO LAW YET	YES	NO	FAVOR BAN ON M-M
ILLINOIS	NO LAW	NO	NO	MOST NEW APARTMENTS HAVE INDIVIDUAL METERS
INDIANA	M-M DISCOURAGED	NO	NO	MOST NEW APARTMENTS HAVE INDIVIDUAL METERS
IOWA	PROPOSED BAN	NO	NO	
KANSAS	NO LAW	NO	NO	MUNICIPAL UTILITIES ALLOW SUBMETERING
KENTUCKY	NO LAW	NO	NO	
LOUISIANA	ELECTRIC M-M BANNED[2]	YES	YES	PROHIBIT CENTRAL SYSTEMS
MAINE	NO LAW	NO	NO	CONCERNED WITH OIL HEAT METER
MARYLAND	M-M BANNED	YES[1]	YES	
MASSACHUSETTS	ELECTRIC M-M BANNED	NO	NO	NO BAN ON GAS M-M, CONSIDERING S-M
MICHIGAN	M-M BANNED	NO[4]	YES	M-M ALLOWED IF OWNER CAN PROVE COST EFFECT
MINNESOTA	ELECTRIC M-M BANNED	NO	YES	STUDYING GAS M-M BAN
MISSISSIPPI	M-M DISCOURAGED	NO	NO	M-M DISCOURAGED
MISSOURI	NO LAW	NO	NO	M-M BAN WOULD HAVE FEW IMPACTS
MONTANA	NO LAW	NO	NO	
NEBRASKA	NO LAW	YES	YES	
NEVADA	M-M DISCOURAGED	YES	YES	ENCOURAGE INDIVIDUAL METERING
NEW HAMPSHIRE	M-M ALLOWED	YES	YES	
NEW JERSEY	ELECTRIC M-M BANNED	NO	YES	
NEW MEXICO	NO LAW	YES	NO	MOSTLY CONCERNED WITH MOBILE HOMES
NEW YORK	ELECTRIC M-M BANNED	NO	YES	IN NEW BUILDINGS UTILITIES ARE NOT TO BE INCLUDED IN RENT
NORTH CAROLINA	M-M BANNED	NO	NO	
NORTH DAKOTA	M-M DISCOURAGED	NO	YES	ENCOURAGE INDIVIDUAL METERING
OHIO	NO LAW	YES	YES	
OKLAHOMA	M-M BANNED	NO	NO	
OREGON	ELECTRIC M-M BANNED	YES	NO	
PENNSYLVANIA	NO LAW	YES	YES	ENCOURAGE INDIVIDUAL METERING
RHODE ISLAND	M-M BANNED	NO	YES	
SOUTH CAROLINA	NO LAW	NO	NO	
SOUTH DAKOTA	NO LAW	NO	NO	
TENNESSEE	NO LAW	NO	NO	
TEXAS	ELECTRIC M-M BANNED	LIMITED	YES	
UTAH	NO LAW	NO	NO	
VERMONT	NO LAW	NO	NO	
VIRGINIA	M-M ALLOWED	LIMITED	NO	WILL PERMIT INDIVIDUAL SUBMETERING
WASHINGTON	NO LAW	NO	YES	GENERIC RATE HEARING TO BE HELD IN FEBRUARY
WEST VIRGINIA	M-M ALLOWED	NO	NO	
WISCONSIN	NO LAW	NO	YES	
WYOMING	NO LAW	YES	NO	PRESENTLY HOLDING HEARINGS

I-M = INDIVIDUAL METERING
M-M = MASTER METERING
S-M = SUBMETERING

[1] ORDER FOR MOBILE HOMES
[2] FOR NEW CONSTRUCTION ONLY
[3] FOR EXISTING DWELLINGS ONLY
[4] MAY ALLOW IN SPECIAL CASES
[5] CURRENTLY HOLDING HEARINGS ON THE MATTER AT THE DISCRETION OF THE SERVING UTILITY

SUMMARY		
M-M	. No Law	= 57%
	. Banned	= 14%
	. Electric Ban Only	= 14%
	. Allowed	= 8%
	. Discouraged	= 8%
S-M	. Banned	= 59%
	. Allowed	= 41%

* Data updated from Alternative Metering Practices, p. 6.

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In addition, there are 3,100 units of local government with enacted building codes, many affecting metering practices in new and existing multifamily housing. Each of the five major building standard groups, ASHRAE,[18] BOCA,[19] ICBO,[20] NCSBCS,[21] and SBCC,[22] have adopted model code provisions which guide individual metering.

B. Federal Benefits

Several federal programs discriminate in the benefits they provide based on the metering configuration of multifamily housing. Chief among these distinctions are benefits for weatherization and for assistance payments.

For weatherization, metering is a determinative element in two government programs. The Residential Conservation Service program, established in 1978 by NECPA, requires every covered utility pursuant to a state plan to offer all customers information on conservation and renewable strategies, a bargain-priced home energy audit, and help in arranging financing and contractors to perform desired conservation improvements.[23] Multifamily units must be included in the RCS program only after January 1, 1982, and then only if they do not have central heating systems.[24] This effectively omits master metered multifamily units from mandatory coverage under the RCS program.

The Low Income Energy Assistance Program (LIEAP) discriminates eligibility, amount and type of payment based on metering configurations in multifamily housing.[25] LIEAP provides block grants to states based on a formula reflecting climate and residential heating expenditures. States make individual assistance payments to cover energy expenses for eligible households at or below roughly 150% of poverty guidelines.[26] Elderly and handicapped families are given a priority for assistance[27] and the Act requires that renters paying for energy indirectly as part of rent be equitably covered.[28] This requires, in theory, that master metered tenants be included commensurately with their individually metered counterparts or low-income owners.

However, the regulations implementing LIEAP allow a state to "deem" a reasonable portion of a private market master metered tenant's rent or income to be the cost eligible for payment under LIEAP.[29] There is no guidance as to the basis for this determination. In many ways this standard is discriminatory. "Deeming" a fixed portion of income or rent to equal eligible LIEAP energy costs compensates most liberally those who have the highest incomes or pay the greatest rent, regardless of actual or estiamted energy costs. Moreover, the regulations do not require that LIEAP payments for master metered tenants be paid to tenants rather than to landlords, are not effective in ensuring payments made in cash and do not require any reduction in rent by benefitted master metering landlords.

Eligible individually metered tenants, who receive LIEAP payments directly, do not suffer these uncertainties. Individually metered tenants receive cash payments not dependent on rent or income, merely based on eligibility. As a result, several state plans will benefit individually metered tenants more than similarly-situated master metered tenants.

LIEAP separately treats five HUD and USDA housing assistance programs and other income-based subsidized housing programs.[30] In master metered assisted housing, the landlord is eligible to directly claim his tenants' subsidies, to the extent he is not already government-subsidized for these costs.[31] Submetered assisted tenants are jointly eligible with their landlord for a split share of LIEAP benefits, based on their respective unsubsidized costs. There is no requirement for notification of tenants when landlords receive LIEAP payments on tenants' behalves, nor is there a consequent requirement that utility charges assessed LIEAP-eligible tenants be reduced by the landlord. The potential exists for significant abuse and discrimination based on metering type when the program commences operation in 1981. On the contrary, individually metered government-assisted tenants are eligible, to the exclusion of their landlords, for LIEAP benefits.

Finally, HUD administered public housing and assisted housing receive different levels of uitlity subsidies based on whether they are master, sub or individually metered. These subsidy disparities can be as great as 50% of the total utility subsidy. These HUD programs and the role of metering are discussed at length in the final chapter of this section. For many low-income tenants, government policy elevates their arbitrary metering configuration to a key determinant of their federal financial assistance. The numerous additional equity implications of a conversion from master to individual meters, are discussed in the next chapter.

Footnotes

[1] P.L. 95-617.

[2] *Id.*, section 115(d)

[3] *Id.*, sections 111(a), 113(a)

[4] *Id.*, *Conference Report* at 72, 75.

[5] *Id.*, section 124.

[6] U.S. Dept. of Energy, *Annual Report to Congress*: *PURPA*, DOE/RG 0034/2, May 1980, at 61. These 34 utilities which have adopted the standard serve approximately 14 million customers. This relies on U.S. Government data, although a recent survey by the National Association of Regulated Utility Commissioners finds substantially greater compliance.

[7] *Id.*, at 106-107.

[8] *Id.*, at 66.

[9] *Id.*, at 63.

[10] Id.

[11] Id., at 64.

[12] National Energy Conservation Policy Act, P.L. 95-619, section 247, amends section 241 of the National Housing Act of 1937.

[13] P.L. 95-82, section 506.

[14] 12 U.S.C. 1715 z-1(f)(1)(i-ii). Conversion is authorized by statute.

[15] 24 C.F.R. 865.400 *et seq*. Conversion is not authorized by statute, but by HUD regulation.

[16] Booz, Allen, *supra*., at 7, V-10; Layfield, *supra*., at 22-23.

[17] With submetering, there is no way to ensure that power is resold at a specified rate, that submeters are accurate, or that tenants have a fair process to dispute their bills. More electric than gas utilities forbid submetering.

[18] American Society of Heating, Refrigerating and Air Conditioning Engineers, 90-75, section 8.4.

[19] Building Officials and Code Administrators, section 601.5.

[20] International Conference of Building Officials, Article 53, section 53111.

[21] National Conference of States on Building Codes and Standards, section 504.1.5.

[22] Southern Building Code Conference, Basic Code, section J-10.5.

[23] NECPA, P.L. 95-619, section 211 _et seq._ Audits cannot cost the consumer more than $15. Energy Security Act, section 544.

[24] Energy Security Act, S.932, section 541. States can extend benefits beyond this federal minimum.

[25] Crude Oil Windfall Profits Tax Act of 1980, P.L. 96-223, Title III. LIEAP, administered by the Department of Health and Human Services, is the descendent of emergency crisis assistance programs administered by the Community Services Administration dating to 1977.

[26] _Id._, section 305.

[27] _Id._, section 308(b)(6).

[28] _Id._, section 308(b)(10); 45 Fed. Reg. 36810 (May 30, 1980) section 260.152(c).

[29] 45 Fed. Reg. 36817 (May 30, 1980).

[30] 45 Fed. Reg. 36810, _et seq._ section 260.202(a).

[31] _Id._, section 260.206(a).

IV. Equity Implications

Not only does federal policy treat tenants differently based on the metering situation in which they find themselves, but differently metered tenants are treated differently by utilities and landlords. These economic distinctions are related to the provision of utility service to tenants.

A. Utility Costs

An individually metered tenant in a large multifamily building is served under the applicable utility rate structure for the residential class of customers. The same building master metered for electricity or gas, whether or not it is submetered, in most instances is served under a commercial rate structure. In almost every jurisdiction, commercial rate structures charge to users lower costs per unit of energy consumed than do residential rate structures.[1] In addition, many commercial users can elect interruptible service, which reduces even further commercial rates. Some states also promote time-of-day rate schedules or load management practices for large commercial users.

Moreover, the majority of states still maintain declining block or promotional rate structures.[2] These rate structures make energy less expensive per unit consumed the larger the quantity consumed per billing period. While this common practice provides a disincentive to conserve,[3] it provides a significant cost advantage to elect master rather than individual metering. A master metered 50-unit multifamily complex consuming an average levelized 20,000 Kwh per month will pay much less per unit of energy than if each tenant were individually metered for an average 400 Kwh per month, in the majority of jurisdictions.

The potential economic impacts on tenants of conversion to individual meters in existing multifamily dwellings is apparent. Calculations on multifamily meter conversions for Detroit,[4] Atlantic City[5] and St. Paul[6] reveal that equal quantities of power after retrofit of individual electric meters will cost 33% more than service through existing master meters. For a multifamily building in Pennsylvania contemplating conversion to individual gas meters, its manager calculated that the total price of gas would double for the same quantity.[7]

For many low-income, elderly or handicapped persons who rent, these higher per unit utility charges alone can create a significant burden. A number of studies have concluded that low-income and elderly families have a relatively inelastic demand for energy; making them much less able than higher income families to reduce consumption in response to higher prices. One study by the Federal Energy Administration concluded *"We make the assessment that an elderly household on a low budget will not decrease its energy consumption by any significant amount in response to energy price increases."* Conversion to individual utility meters is a conservation technique which is effective only if consumers are able to make lifestyle changes decreasing usage as a result of individual price signals. To the extent that elderly, low-income or other tenants with inelastic demand are not able to respond significantly, individual metering becomes a costly investment which yields few conservation savings and saddles those least able to pay with higher utility charges.

These economic impacts are exacerbated by additional utility and owner costs. Tenants converted to individual metering will each be required to post a security deposit with each utility supplier in almost every jurisdiction nationwide.[10] It is common to find requirements of $75-100 deposits[11] or deposits equivalent to two months' usage.[12] For previously master metered tenants of low income, who have developed no previous credit history with utility suppliers, deposit requirements as a prerequisite to service can pose a substantial financial obligation. Moreover, individually metered tenants often must pay penalties for late payment of charges.

Additional costs can be imposed de facto by landlords as a result of conversion to individual metering systems. Studies of meter conversions have found no evidence of resultant rent decreases after conversion to reflect lower utility costs born by tenant rents.[13] If owners attempt to recoupt their retrofit costs over two or three years, they may actually increase rents after conversion to individual metering systems. Even if a tenant in this situation is able to conserve substantial amounts of energy, he may experience an increase in total utility costs. With all of its variations, meter conversion can create a multitude of economic costs for affected tenants.

B. Termination and Eviction

Termination of utility service is the ghostly companion of individual tenant metering. Master metered multifamily "commercial" buildings, as a general rule, face only limited threat of termination of service. On the contrary, individually metered units face a constant threat of utility termination on short notice for real or alleged nonpayment of bills. The dimensions of the problem are immense. Sampling data indicates that there are between 2-3 million terminations annually imposed just by regulated electric utilities.[14] This does not include gas, fuel oil or municipal utilities. The problem of terminations has flooded the courts and reached the Supreme Court twice in 4 years.[15]

Customer service policies are regulated by state authorities, and they vary widely. Few jurisdictions have comprehensive due process or notice requirements to protect tenants. Five states have no regulations on termination, whatsoever.[16] Eleven states allow one month or more after billing before an account is subject to termination; 15 jurisdictions allow 2-4 weeks, while 4 states allow 10 days or fewer, and 16 states have no minimum limits.[17] Half the jurisdictions provide for postponement of termination during serious illness or medical emergency. Eight states disallow routine terminations during winter months, but the great majority of jurisdictions have no such limitations.[18]

In most states, tenants are not even give notice of imminent termination of their service when the owner is in arrears on paying bills. Only 14 states require any notice of termination of service to individually metered tenants who are not direct customers of the utility; 7 by individual notice, 4 by posting notice in building common areas, and 3 by both individual and common notification.[19] Only 15 states require notification of termination of utility service to master metered tenants; 5 by

Table 6

STATUS OF CONSIDERATION PROCESS FOR THE TERMINATION OF SERVICE STANDARD

	Status					
Regulatory Standard	Process Not Started	Process Started But No Determination Made	Determination Made to Adopt Standard	Standard Put into Effect	Standard Rejected	Total
Regulated						
- Electric	87	94	12	54	0	247
- Gas	74	65	5	54	0	198
Nonregulated						
- Electric	54	7	0	8	0	69
- Gas	5	2	2	3	0	12
Total	220	168	19	119	0	526

Source: U.S. Dept. of Energy, Annual Report to Congress: PURPA, DOE?RG 0034/2, May 1980 individual notice, 6 by posting notification in building common areas, and 4 by both means.[20] Therefore, both master and submetered tenants are seldom provided notice of shut-offs, even in situations where they pay rent or utility assessments to owners for the designated purpose of securing adequate utility service. Tenants thus can suffer the physical and economic consequences of an unscrupulous owner's non-payment of utility charges.

PURPA requires that all covered utilities consider their standards on termination of service.[21] The most recent data available indicates that this review process and not been begun for one-third of the regulated and two-thirds of the noregulated utilities.[22] (Table 6). It is not expected that these considerations will alter fundamentally the susceptible position of individually metered tenants to termination. Even more telling, most utilities considering termination pursuant to PURPA are only covering residential customers; affording no protection to master or submetered commercial customers.[23]

Eviction is the flip side of the coin for master or submetered tenants. If rents or utility surcharges cannot be paid, in typical multifamily leases it is deemed good cause for eviction. For individual metering, if termination of service occurs, the resultant failure to keep heat in the dwelling violates provisions of many leases. In at least one state, failure to pay a charge assessed by a municipal utility results in the attachment of an automatic lien on the real estate of the offending customers.[24] For federally subsidized or assisted housing, nonpayment of utility costs is good cause for eviction.[25] In situations in which the owner collects but omits to pay utility charges for master or submetered property, tenants who indirectly have already "paid" for utilities can be the victims of utility terminations. With minimal protection, and maximum vulnerability to termination or eviction, individually metered multifamily rental dwellings are at the cutting edge of utility service policies.

Footnotes

[1] This is in part because there is only one customer charge for the entire building under a commercial rate. Whereas for residential rates, there would be a customer charge associated with each meter. The customer charge in this context is quite regressive. The utility company experiences fewer costs in servicing, reading and collecting from a master metered multi-family building.

[2] Conversation with personnel at the Electric Power Research Institute, Palo Alto, California.

[3] One of the standards established by section III(d)(2) of PURPA is the elimination of declining block rates. This standard pertains only to declining costs for the energy component of the rate, not to the demand or customer components.

[4] MRI, Energy Conservation Implications of Master Metering, at 41 (Table XII).

[5] Letter from T. J. Verdon, HUD New Jersey Area Office, to S. Ferrey, National Consu Law Center, November 7, 1977.

[6] Letter from M. D. Anderson, Executive Director of Housing and Redevelopment Authority, City of St. Paul, to T. Feeney, HUD Area Office, September 29, 1977.

[7] Letter from O. L. Simmons, Executive Director Keyser Housing Authrotiy, to R. Easley, HUD Area Office, November 4, 1977.

[8] Berman, et al., The Impact of Electricity Price Increases On Income Groups. Rand Corp. 1972. This concludes that low-income families have a price elasticity for electricity of -0.5 while upper and middle income families' elasticity is -1.2. Another study concludes that price elasticities for electricity are -0.31 for high income, -0.85 for middle income, and +1.2 for low income groups. Roth, "Micro-data Measurement of Residential Rate Restructing," 97 Public Utilities Fortnightly, 28, 30-32 (Jan. 15, 1976).

[9] Federal Energy Administration, The Effects of Rising Energy Prices on the Low and Moderate Income Elderly, at 2.42 (1975).

[10] National Association of Regulatory Utility Commissioners, Annual Report on Utility and Carrier Regulation, 1976.

[11] Id. See also letter from J.V. Walsh, Atlantic City Electric, to Louise Cox, Cape May Housing Authority, June 15, 1976.

[12] Id., See also letter from J.B. Shilling, Butler Housing Authority, to R. Easley, HUD Area Office, Nov. 26, 1976.

[13] Booz, Allen, supra., at IV-5.

[14] The FEA in 1977 found that, for but 20 percent of the electric utilities with operating revenues of $1 million or more, there were over 2.7 million actual terminations from 1972 to 1976. FEA, Office of Consumer Affairs and Special Impact, Preliminary Draft Analysis of Involuntary Residential Utility Disconnections 1972-1976 at 4-5.

[15] See, e.g., Memphis Light, Gas & Water Division v. Craft, 434 U.S. ___, 98 S.Ct. 1554 (1978) (low income); Jackson v. Metropolitan Edison Co., 419 U.S. 345 (1974) (tenant, in forma pauperis suit).

[16] National Consumer Law Center, A Compendium and Analysis of State Regulations and Laws Regulating Utility Service Terminations and Disputes, 1980, at 42.

[17] Id., at 69-70.

[18] Id., at 103.

[19] Id., at 82.

[20] Id., at 83.

[21] P.L. 95-617, sections 113(b)(4), 115(g)(1).

[22] PURPA: Annual Report to Congress, supra., at 77.

[23] Id., at 82.

[24] Massachusetts Acts of 1980, chapter 551.

[25] See for example, 24 C.F.R. 866(a).

V. Policy Implications

Conservation in the residential sector is a dynamic concept: As energy costs escalate and new techniques become available greater and more sophisticated levels of conservation are constantly becoming cost-effective. Conversion of master or submetered units to individual metering shifts the economic utility burden away from landlords onto tenants. While some one-time tenant lifestyle changes may be possible, market forces no longer motivate owners. The dynamic power of the market is thus decoupled from owners, who are responsible for capital improvements to buildings. Potent market forces are lost, and unpopular regulatory approaches only are left to motivate multifamily owners to achieve adequate levels of thermal quality.

Equally important for urban areas, individual metering of heating utilities promotes the employment of electric heating for space and hot water, contrary to national policy. This occurs for two primary reasons. First, in many urban regions, land-constrained multifamily construction is built several stories in heighth. Local building codes often prevent the extention of gas lines or the placing of oil furnaces above the second or third floor, for safety reasons. Heating equipment is thus often placed on ground or basement levels. Because BTU meters to submeter fossil-fired central boilers are prohibited and too expensive, and individual furnaces with separate pipe runs and venting are too expensive, the only practical individually metered option is electric heating.

Second, because the cost of tapping electric heating into existing individually metered electricity circuits is much less expensive than adding individual fossil furnaces and distribution networks, builders and owners (who will not pay individually metered heating expenses), naturally prefer electricity. Consequently, approximately two-thirds of all new residential construction completed in the last few years is of all-electric design.[2]

Individual metering as a multifamily retrofit strategy encourages even more the use of electric heating. Most older multifamily dwellings have pipe runs vertically through a multilevel building. Apartments, typically laid out horizontally, can not be individually metered for hydronic systems, even employing BTU submeters, using existing vertical plumbing and ducting. The cost of ripping through walls to replumb a building so far outweighs the cost of retrofit adaptation to electric heating, that conversion to electric heating is preferred to conversion to individually metered fossil fuel heating.

The energy waste and efficiency loss in converting from fossil to electric heating systems is significant. The total energy end-use efficiency of a new natural gas heating system ranges between 54-63%.[3] The total energy end-use efficiency of conventionally-generated electric resistance heating is 29-30% after distribution.[4] Electric resistance heating is approximately half as efficient in delivering heating energy.

Therefore, any lifestyle changes motivated by meter conversion will be offset by efficiency losses if the conversion introduces electric resistance heating. Even conversion from a single fossil-fired central boiler to several individual furnaces will involve significant efficiency losses from multiple vent and greater jacket heat losses.[5] A Department of Energy study concludes that likely energy savings, if any, will not offset the costs and efficiency losses of meter conversions of any heating systems.[6]

Individual metering of electric or fossil space or water heating poses significant barriers for later adaptation to central solar thermal, district heating or congeneration systems. What each of these alternative energy systems has in common is that they produce usable heat, rather than deliver chemical or electrical energy, to the building meter. In an individually metered electrically heated multifamily building, pipe configurations likely will not exist to deliver this alterantive heat to dwellings. In an individually metered gas or oil heated building, one of two situations is present. If furnaces are in individual units, plumbing does not exist to carry heat, rather than chemical fuel, to individual dwelling units.

If on the other hand, individual furances are located together in accessible common space, it is technically feasible to feed heat into individual distribution systems. But given diverse load patterns and lack of individual thermal storage, it is impossible to distribute heat equitably or run existing furances efficiently. Only with a central heating and distribution system, which will be master metered, can central solar thermal, district heating or cogeneration technologies be productively paired. Conservation policy, especially with respect to metering, should be integrated with the nation's long-term goals to shift to efficient domestic and renewable technologies.

A long-term conservation policy for multifamily rental stock must have 4 objectives:

- Employ the most thermodynamically appropriate fuels.
- Utilize the most efficient heating systems.
- Do not shield owners, responsible for efficient capital improvements, from market incentives.
- Provide tenants who are able to conserve economic feedback on their consumption.

These 4 principals cast serious doubt upon the wisdom of national policy promoting conversion to individual metering for heating in existing urban multifamily dwellings. In many respects, a national policy of conversion to individual metering simultaneously poses substantial obstacles to national fuels policy and the intelligent operation of the market.

Ultimately, the solution may lie with the mass production of inexpensive, accurate BTU flow meters. These meters will allow the retention of efficient central boilers, the use of fossil fuels or electricity, and appropriate economic signals to both owners and tenants. Until that time, the Resident Utility Billing System (RUBS) provides a more equitable, if not perfect, means to allocate heating costs to tenants while preserving the economic, efficiency and administrative advantages of existing urban master-metered systems.[7]

Footnotes

[1] The exception would be in areas where rental dwellings are in oversupply, a relatively rare situation in light of recent low multifamily housing starts and condominium conversions.

[2] Letter from W.J. Maczka, Electric Light and Power, to S. Ferrey, National Consumer Law Center, August 5, 1977.

An industry publication reported 2 years ago that 58% of all builders were installing electric heating in new multifamily design. "Survey Shows What Builders Plan for Rentals, Plexes, Townhouses and Condos," in Professional Builder, September 1978.

[3] Harral, et al., A Comparison of Energy Options: Gas or Electricity, Pacific Gas & Electric Co., 1977 (63% and 29%); U.S. Dept. of Energy, Heat Pump Technology, June 1978 (54% and 29%); Booz, Allen, supra., at II-16-17. These studies assume a gas system is properly sized and operating near full load.

[4] Id. Hydroelectric power, which constitutes less than 15% of total national electric generation, operates at higher efficiencies of conversion. Heat pump technology also operates at much higher efficiencies in mild climates.

[5] Layfield, supra., at 34.

[6] Booz, Allen, supra., at III-18-26.

[7] Institute of Behavioral Science, Encouraging Energy Conservation in Multifamily Housing: RUBS and Other Methods of Allocating Energy Costs to Residents, 1980. RUBS allocates master metered heating costs on the basis of residential floor space. While this system has limitations, it is generally more equitable than inclusion of heating costs in rent without respect to personal space heated. Seventeen states prohibit the use of RUBS, as does HUD for public and assisted housing.

VI. HUD Metering Policy

An entire book length is required to adequately discuss metering practices and related policies in public and HUD-assisted and subsidized housing. Here, though, briefly illustrated are the determinative nature of metering configurations on tenant utility subsidies, their variation in different types of public and subsidized housing,[1] and consequently equity implications for tenants.

There are three primary types of rental housing overseen and partially financed by HUD. Public housing, the largest, is administered by local public housing authorities (PHAs) which receive annual contribution contracts from HUD servicing the debt on federally guaranteed tax exempt local bonds used to construc or acquire housing projects.[2] Tenants pay 25% of income for "shelter," as provided by the Brooke Amendment to the National Housing Act.[3]

HUD administers several private market programs. Section 8 is a private market alternative to public housing, currently providing about one-third as many dwellings.[4] HUD provides eligible low and moderate income families with certificates which entitle their landlord to a subsidy equal to the difference between established fair market rent (not exceeding actual rent) and a family's rent contribution of 25% of adjusted income. Section 8 subsidies also are available for newly constructed and substantially rehabilitated housing. Section 236 and Section 221(d)(3) programs provide mortgage insurance and interest subsidies to owners of low and moderate income multifamily rental housing to reduce financing costs and thus create less costly rental units.[5] These subsidized programs are much more limited in scope than public and Section 8 programs.

Each of these programs involves a different degree of government control, a different type of HUD subsidy, and different treatment of utility costs. Public housing is financed by the federal government and operated by local government without profit at cost. To the extent that utility costs are not covered by tenant shelter contributions, HUD ultimately pays these costs.

Sections 8, 236 and 221(d)(3) housing are privately operated, in many cases for profit, subject to partial federal financing and consequent restrictions; which effectively operate as a type of rent control. In their operation, energy costs function as a wild card -- allocating utility expenses between tenants, owners and HUD. The value of this wild card is dictated by utility metering.

A. Public Housing

Public housing is representative of the energy dilemma confronting tenants, and the pivotal role of metering, in HUD-subsidized multifamily housing. Most of the public housing stock is old; built before the 1973 Nixon moratorium on new PHA construction. Consequently, all public housing constructed between 1937 and 1973 was subject to minimum property standards[6] so lax that their thermal (conservation) requirements in most climatic regions could be met by using a piece of Saran-Wrap, and nothing else, for a project's walls.[7] These poorly constructed buildings left a legacy of energy waste built into the low-income rental stock.

As one critic observed:

> "The federal standards between 1950 and 1973 were progressively tightened, in bold leaps, from nothing to insignificant."[8]

Initially, HUD encouraged public housing to be master metered. The agency is not sure of the exact proportion of metering types in public housing. Estimates indicate that about one-quarter of gas and one-third to one-half of electric service is individually metered, with the bulk master and submetered.[9] Since 1976, HUD by regulation has vigorously promoted PHA conversion from master to individual or submetering.[10] In response to litigation,[11] while still promoting meter conversions, new regulations dictate that meter conversion must now compete for financing on the basis of cost-effectiveness with 20 other conservation and solar measures.

The amount of federal utility subsidy PHA tenants receive is directly determined by the type of meter they encounter in their rental unit. The Brooke Amendment to the National Housing Act mandates that PHA tenants can not pay in excess of 25% of adjusted family income for "shelter."[13] Shelter has always been interpreted to include reasonable and necessary quantities of utility service.[14] However, under HUD regulations what is "reasonable," known as the utility "allowance," varies greatly depending on a unit's metering.

Individually metered public housing operates under a tenant utility allowance based on the historic average consumption of similarly-sized units of like construction.[15] The allowance is provided as a cash deduction from monthly rent; leaving the tenant to pocket, or pay out-of-pocket, for utility use below or above the amount represented by the allowance.[16]

Sub-metered tenants recieve an allowance established to fully cover the utility expenses of 90% of dwellings of each size in a project.[17] The other 10% of tenants can be "surcharged" for the excess portion of their consumption.[18] In no event can the allowance result in the surcharge of greater than 25% of sub-metered tenants in any billing period.[19] The submetered utility allowance is provided as an in-kind quantity of free energy. Below the designated allowance quantity, utility consumption is not charged to a tenant; above the quantity, surcharges are collected.[20]

Master metered tenants recieve no utility allowance, and do not pay directly for any utility consumption. However, master metered tenants are billed flat monthly charges for possession of appliances which local PHAs deem "unauthorized."[21] These typically include air-conditioners, window fans, washing or drying machines, portable heaters and freezers. The flat monthly charges are assessed tenants whether or not they ever use "Unauthorized" appliances they possess -- a practice even HUD admits is inequitable.

The bases and results for tenants of these three utility allowance schemes vary widely. For master metered tenants, all utilities are provided while ownership of "unauthorized" appliances is financially penalized. The allowance for sub-metered tenants is based on historical precedent and actual distributional data of PHA consumption.[22] Allowances for individually metered tenants, set at average consumption, are more established for administrative ease, than at levels determined to be scientifically or experientially reasonable for tenants.

Four forms of tenant inequity are inherent in this system. First, individually metered tenants receive an allowance for utilities which translates to an average of 35-50% less than that afforded identically situated sub-metered tenants.[23] Second, the cost per unit of energy is more expensive for individually metered tenants (with smaller allowances) in that majority of states with declining block or commercial multifamily rates.

Third, individually metered tenants potentially are subject to costly security deposits, late payment fees, termination, and reconnect fees unlike submetered tenants. All of these significant discriminations in reasonable utility allowances are attributable solely to arbitrary dwelling metering, not to tenant usage or need. Fourth, for individually metered tenants, the simplistic allowance formula makes no provision for units, which because of their location within a building or because of poor thermal quality, are inherent energy wasters beyond tenant control.[24]

B. Subsidized Housing

For federally-subsidized private market housing, federal policy offers much less direction and control over utility aspects of operation. Section 8 assistance is the dominant form of HUD subsidization. Sub-metering is much less prevalent than in public housing. In return for paying a designated portion of adjusted income towards rent, a section 8 family is entitled to utility service.[25] If individually metered, an adequate utility allowance as a cash deduction from rent must be established by the owner in consultation with HUD.

Utility allowances are similarly calculated for section 8 new construction, substantially rehabilitated and existing housing. Allowances are established at average consumption by unit size for similarly constructed dwellings.[26] Unlike public housing, there is no requirement to utilize actual data from the multifamily building.

If a tenant is required to supply his own refrigerator or range, the utility allowance must include the cost of leasing or financing these appliances.[27] An individually metered section 8 tenant can receive a utility allowance no larger than his contribution to rent,[28] unlike very low income PHA tenants who are allowed to pay negative rent. Therefore, a very low-income individually metered section 8 tenant can pay out-of-pocket more for rent and utilities than his master metered section 8 or public housing counterparts.

Section 236 subsidized housing operates in a more complex regulatory environment, but still meter-determined. The section 236 statute declares that rents shall equal 25% of income less "such an amount... as the Secretary determines represents a proportionate decrease for (tenant-paid) utility charges..."[29] Tenants pay the greater of the established basic rent or 25% of adjusted income for shelter costs including utilities.[30] In master metered subsidized housing, total utilties are supplied for a fixed rent, although an owner can levy a charge for major tenant-supplied appliances. For individually metered subsidized tenants, the utility allowance is provided in the form of a Personal Benefit Expense (PBE).

The operation of the PBE injects inconsistencies into the administration of subsidized housing. Neither master nor sub-metered tenants are affected by the PBE. They receive utility service, and in turn their rent reflects a pro rata share of building utility costs. Sub-metered tenants can be surcharged for excessive consumption, although HUD provides no guidelines for administering allowances and surcharges.[31] Only some individually metered tenants actually receive a PBE. Unlike public housing, in which the 25% of tenant income contribution is a ceiling, 25% of income is a floor for section 236 tenant contributions. In cases where 25% of income exceeds basic rent, the greater amount is always paid.

Individually metered tenants paying basic rent receive no PBE; rather paying a pro rata share of utility expenses included in basic rent. Individually metered tenants paying 25% of income for rent recieve a PBE as a cash deduction from rent. However, in no event can these tenants pay less than 20% of adjusted income for rent as a result of the PBE.[32] Unlike public housing, the PBE (utility allowance) need not be based on actual consumption experience of each building or be reasonably adequate, thus it need not reflect the thermal quality of the actual units to which it applies.[33]

Meter conversions are also encouraged in subsidized housing.[34] However, section 236 meter conversion costs are not subsidized. The incentive for owners is to shift the utility obligation from inclusion in total basic rent to individual tenant responsibility. Since a PBE cannot reduce net contract rent below 20% of adjusted income, the tenant/HUD ratio of utility expense incidence is usually increased after conversion.

All section 236 projects are potentially eligible for federal tax and utility operating subsidies.[35] Section 236 tenants are eligible to recieve rental assistance payments which reduce rent to 25% of adjusted income, but not less than attributable utility costs, unless this provision is waived by HUD.[36] Tenants who receive assistance under the rent supplement program have their utility costs somewhat differently determined.[37] Since section 221(d)(3) tenants pay rent equal to the costs of operating the unit and amortizing the building loan, there are no utility allowances regardless of utility expenses.

This complex utility regulatory mosaic results in a significant inequity for individually metered section 236 tenants. Since the PBE cannot reduce a tenant's rent contribution below 20% of adjusted income, the PBE cannot exceed 5% of any tenant's income. The cash value of the PBE is directly related to tenant income. Thus, the utility allowance, within limits, becomes a direct function of tenant income. For poorer section 236 tenants, the PBE to which the unit is entitled cannot be fully realized because of their limited income. These allowance limitations do not occur in master metered units.

Basic energy requirements, however, have little or nothing to do with metering type or income, given low-income tenants occupying a standardized dwelling size. As with public housing, the fortuitous metering configuration which serves any unit is the significant factor in determining the utility subsidy its inhabitants receive. Consequently, metering is elevated to an inequitable arbiter of personal income for tenants of low income.

Footnotes

[1] For considerations of length, HUD-assisted housing is not discussed. For a more robust discussion of these issues, see Steven Ferrey, "Ghosts of Cold November: An examination of HUD's Energy Conservation Policy for the Poor," in *National Clearinghouse Review*, May 1977; Steven Ferrey, "Energy Needs of the Poor," in *National Clearinghouse Review*, August 1977.

[2] There are over 3 million public housing tenants inhabiting over one million public housing dwellings nationwide. HUD, *1976 Statistical Yearbook*, Table 108, at 169. Almost half of these units house elderly or handicapped individuals. *Id.*, Table 109, at 170.

[3] 42 U.S.C. 1437(a). Tenants pay contract rent not to exceed 25% of adjusted income, which for almost all tenants results in 25% of income being paid.

[4] HUD, *1976 Statistical Yearbook*. P.L. 73-379 as amended.

[5] National Housing Act, sections 236, 221(d)(3), P.L. 73-479, as amended.

[6] PHA minimum property standards were created in two generations prior to 1974. Before 1950, there were no standards. Between 1950-63, nonbinding bullegins were in effect. PHA, *Plumbing, Heating and Ventilation*, Part 1, Bulletin LR-7, March 24, 1950; PHA, *Structural Design, Materials and Methods*, Part XI, Bulletin LR-5, April 24, 1950. In July and May, 1963, respectively, these bulletins were updated to require more stringent thermal standards for new construction. Significant standards were promulgated beginning in 1973.

[7] Ferrey, *Ghosts of Cold November, supra*., at 4.

[8] *Id.*, at 5.

[9] HUD estimates have varied widely. Based on 1977 data,

Estimates for electricity: master metered - 59%
sub-metered - 12%
individually metered - 29%

Estimates for natural gas: master metered - 42%
sub-metered - 33%
individually metered - 25%

Minutes, HUD Task Force on Tenant Participation In the Management of Low-Income Housing, February 1977 (HUD official states 71% of electricity and 75% of gas not individually retail metered); Affidavit of R.Ulf, HUD, in Mass Union, et al., v. Landrieu, et al., in the U.S. Court of Appeals for the District of Columbia Circuit, Docket No. 80-1332 (63% master PHA gas meters, 42% master PHA electric meters).

[10] 24 C.F.R. 865.400 et seq. First promulgated in May 1976, this regulation required every PHA to perform a benefit/cost analysis regarding meter conversion, and required all PHA's to assume that conversion to sub or individual metering would automatically conserve 25-35% of PHA heating energy, regardless of condition of the project, lack of insulation or types of tenancies. Id., section 865.404. If under these required assumptions meter conversion was cost-effective by even $1 over 20 years, PHAs were required to request modernization or other funds to convert. Id. No other conservation alternatives were to be evaluated. No other "conservation" activities were mandatory.

[11] Massachusetts Union of Public Housing Tenants, et al., v. Landrieu, et al., in the U.S. Court of Appeals for the District of Columbia Circuit, Docket No. 80-1332 (pending).

[12] 45 Fed. Reg. 30347 et seq. (May 7, 1980). These new regulations still carry forward the required assumption that meter conversion of a PHA heating system automatically conserves 25-35% of heating energy. Id., section 865.305(a). None of the other 20 competing conservation measures have specified formulae for savings.

[13] 42 U.S.C. 1437(a).

[14] HUD, Local Housing Authority Management Handbook, Part II, section 9, 1963.

[15] Allowances are based on 3 years average historic consumption of all dwellings in a project of similar bedroom size, if data is available, or otherwise the best available data. 45 Fed. Reg. 59506, sections 865.473-.476.

[16] Id., sections 865.475(b), 865.478.

[17] Id., section 865.477.

[18] Id., section 865.479. To the extent that PHAs surcharge certain tenants, they can collect double for a certain portion of project utility expenses. PHAs, pursuant to the performance funding

system receive from HUD each year total projected utility expenses based on historic data and current rates. 45 Fed. Reg. 35776 *et seq*. (May 27, 1980); *Management Handbook*, *supra*., Part II, section 9, at 17-20; Ferrey, *Ghosts of Cold November*, supra., at 12. If in addition, PHAs collect surcharges for a portion of this consumption, they reap the benefit of being paid twice for the same block of utility expense.

[19] *Id*., section 865.480(b). There have been numerous suits contesting excessive surcharging under allegedly inadequate allowances. *See*, for example, *Wright* v. *Buffalo Municipal Housing Authority*, No. 77-88 (W.D.N.Y. 1978); *Residents Advisory Council* v. *Housing Authority of Charlotte*, No. CC-76-106 (W.D.N.C.).

[20] Surcharges are collected at the average cost of utilities to the project's master meter. 45 Fed. Reg. 59507, section 865.479.

[21] *Management Handbook*, *supra*., Part II, section 9, at 20; HUD circular RHM 7465.7.

[22] *Id*., at 14-20. Ferrey and Bachman, *Statistical Analysis of Proposed HUD Utility Allowance Regulations,* 1977.

[23] *Id*.

[24] The heating load is in part a function of climate -- temperature, humidity, wind and insolation (the amount of solar heat reaching exposed surfaces). Heating load is also, of course, affected by the building itself -- how well it is insulated, how well sealed against air infiltration, whether it is equipped with storm doors and windows. The interaction of climate and building characteristics can result in radically different energy requirements in the same community. Thus, an apartment located on the northeast corner of the top floor of a building requires far more energy to heat than an apartment of the same size located in the middle of the south side of the same building. The top floor apratment has two walls and a roof exposed to the weather and receives no direct sunlight. Through those exposed surfaces it loses great quantities of heat because of lack of insulation and storm windows. The south side apartment has a single exposed wall and that wall receives direct solar heat. Through floor and ceiling and on three sides it receives heat from neighboring units. *See* V. Olgay, *Design with Climate* (1963); American Institute of Architects, *Energy Conservation in Building Design* (1974); C.W. Driffen, *Energy-Conservation in Buildings* (1974).

[25] HUD New Construction Processing Handbook 7420.1 7-8; HUD Administrative Practices Handbook 7420.7; HUD Form 52667.

[26] Id.

[27] Handbook 7420.1, supra., at App 22, p.4; Handbook 7420.7, supra, paragraph 11-5e.

[28] 24 C.F.R. 880.604, as amended.

[29] 12 U.S.C. 1715z-1(f)(1).

[30] 24 C.F.R. 236.55(b)

[31] HUD Handbook 4510.1, paragraph 5-29.

[32] 12 U.S.C. 1715z-1(f)(1); 24 C.F.R. 236.55(b)(ii).

[33] The PBE must be documented at time of rent increases. HUD Handbook 4350.1, paragraph 10(b)(3). The PBE must be adjusted whenever utility costs increase cumulatively by 10% or more. 24 C.F.R. 236.55(c).

[34] HUD Handbook 4350.1, chap. 4, section 3, paragraph 10(c).

[35] 12 U.S.C. 1715z-1(f)(3); 24 C.F.R. 236.901.

[36] 12 U.S.C. 1715z-1(f)(2).

[37] 24 C.F.R. 215.25(a); HUD Handbook 4520.1, paragraph 2-6(d).

PART II: UTILITY FINANCING

I. Utility Financing For Urban Conservation

Utility financing of conservation and renewable investments has burgeoned in the last few years as one of the most promising new forms of capital creation for energy efficiency retrofits. The states of Oregon, California, Washington, Michigan, Arkansas and Montana, as well as the Tennessee Valley Authority, have implemented or are in the process of implementing utility financing programs. It is anticipated that several additional jurisdictions will initiate consideration of utility financing in the near future.

Utility finance of residential and commercial efficiency improvements offers many attractive features to reach the urban housing stock:

- Utilities have existing relationships with virtually every dwelling.
- The rate mechanism for financing a conservation program already exists.
- Utilities have much more favorable access to debt capital than do individual borrowers.
- Utilities faced with capacity expansion requirements, unlike many owners or renters, can bring an objective "least cost" life-cycle investment perspective to financial decision making.

Moreover, utility finance mechanisms can target subsidies to allocate benefits among households in a service territory. Historically, utilities have differentially subsidized consumption with credits to builders of all-electric homes, benefitial pricing of certain major appliances or all-electric reduced rates. Correspondingly, the promotion of greater efficiency can be tailored to particular opportunities and needs. The savings which the utility realizes by improving end-use efficiency rather than adding additional capacity can be provided as consumer incentives in the form of:

- cash payments
- bill credits
- subsidized or zero-interest loans
- utility investment in efficiency improvements[1]

The schedule and amount of payments or interest subsidies can be structured so as to vary the magnitude and timing of incentives.[2]

As a means to reach the urban housing stock, utility financing has potential limitations. The utility maintains a relationship with the metered party, not with those responsible for efficiency improvements. In a master metered multifamily building, the utility sells all power to the owner, but in an individually metered building, the utility relationship with the owner concerns only energy for building common space. If a utility delivers utility-financed incentives through a wholly-owned single project non-utility subsidiary, utility financing will operate largely beyond direct regulatory oversight at the state level.[3] Such activities not subject to conventional regulation can earn a higher rate of profit than the regulated monopoly activities of an investor-owned utility; thus increasing the costs of accomplished energy conservation.[4]

Important equity implications accompany the design of a utility financed conservation program. The equity to residential customers is significantly determined by:

- who are eligible participants
- what conservation measures are financed
- timing and depth of subsidy
- cost-effectiveness of measures
- source of utility financing revenues
- type of energy displaced
- applicable rate structures
- allocation of conserved fuel
- embedded costs and long run incremental costs to the sponsoring utility

Within these nine variables, a program will achieve varying degrees of equity among differently situated customers of the utility. For any given utility finance plan, it is possible to mitigate built-in inequities. Because urban areas contain large numbers of renters, poor and elderly customers, who traditionally have had difficulty taking advantage of conservation and solar incentives, program equity is of paramount importance.

Footnotes

[1] Utility investment in conservation or renewable energy can be accompanied by utility ownership of the installed materials. For example, in case OII-42 in California, P.G.& E. proposed to own 2000 solar water heaters installed in the homes of low-income participants. Significantly, state and federal tax credits pass to the owner of a renewable system or conservation device. On the federal level, utility ownership will deny dwelling owners a 40% solar and 15% conservation tax credits. In lieu, the utility can take a 10% investment tax credit on these investments.

[2] Payments of incentives or repayment loan principal can be levelized, altered over time, indexed to utility rates, or associated with sale or turnover of the dwelling. The incentive which the consumer perceives is affected by the type of fuel used, the applicable rate structure, the discount rate and the expected inflation in energy costs.

[3] Although state control over a subsidiary will be influenced by the actual structuring of the subsidiary, traditionally, non-utility investments made by a utility are not regulated by a state public utility commission.

[4] This is similar to the activities of A.T.& T. which moved into the unregulated communication service field after it lost its monopoly over the supply of telephone equipment. *See* W.J. Broad, "Ma Bell Losing Grip on Old Markets," in *Science*, Aug. 15, 1980, at 787. C.P. National Corporation, a small utility in the West, is diversifying into the broader energy service business.

II. Shareholder-Ratepayer Equity

A. Economics

While a utility can finance a conservation project, it does not absorb the costs of subsidies. Utility financing takes ultimate financial resource to one or several classes of ratepayers. These costs are reflected in the company's revenue requirement and passed on in rates for energy service provided to customers. Utility financing implies a lending service which as contemplated by those states pioneering the concept, involves the redistribution of ratepayer money, and consequent equity implications.

What makes utility financing particularly attractive programatically is its potential ability to make all ratepayers better-off even though it redistributes money from some to others. The reason for this phenomenon is three-fold. First, because of load growth, additional energy must be produced either by building additional system capacity or by making available currently obligated capacity by improving efficiency. The latter is the least-cost alternative.[1]

Second, because many of these efficiency improvements are in energy end-use on the customers' sides of utility meters, the efficiency improvement is made to an individually-owned dwelling (consumption) rather than to the utility company system (production). Third, because utility rates must non-discriminatorily charge residential customers on the basis of energy consumption, savings of reduced consumption inure to the benefit of individual consumers, while the capacity made available benefits all consumers.

Therefore, all consumers are better off because capacity is made available in the least-cost fashion, while customers making cost-effective retrofit improvements are better off yet by virtue of realizing lower energy costs and perhaps a more valuable dwelling.

This economic phenomenon occurs with or without utility financing. However, utility financing motivates, accentuates and accelerates the process by transferring subsidies from an entire class of ratepayers to those who undertake efficiency improvements. For ratepayers, it is akin to benefiting from the least of two necessary evils: They literally are better off economically paying for their neighbors' conservation than for their utility's expansion.

This phenomenon is depicted graphically in Figure 1. Figure 1 represents a utility experiencing increasing marginal costs with scale. This hypothetical utility is on production function A-A, producing quantity Q^1 at equilibrium price per unit of P^1. Increased quantity of energy, Q^2, is required either from production or conservation. If the utility does not build extra capacity, but instead remains with production capabilities A-A, it must purchase extra power from neighboring utilities resulting in total price P^4 to have available quantity Q^2.

There are two other options. On the one hand, it can purchase extra capacity by conservation represented by production function C-C. At equilibrium point 'y', quantity Q^2 is achieved at price P^2. On the other hand, building extra capacity is available on production function B-B, achieving quantity Q^2 system equilibrium at point 'z', representing price P^3. Ratepayers prefer the conservation option because it delivers quantity Q^2 at a lower price ($P^2 < P^3$). In either situation, the revenue requirement (the shaded area under the curve at equilibrium) increases from the original requirement represented as P^1-O-Q^1-x. Society, in the form of utility regulators, should also prefer the conservation option, since it minimizes the total increase in the utility revenue requirement ($P^2-O-Q^2-y < P^3-O-Q^2-z$).

However, most interesting to note are the potentially contradictory preferences of ratepayers who participate in the utility financed conservation program and the utility itself. Part of the extra revenue requirement ($m-Q^1-Q^2-y$) is available not for utility projects but for conservation subsidies to individuals. These "participating" ratepayers favor the conservation option under which they personally receive a share of this portion of the revenue requirement.

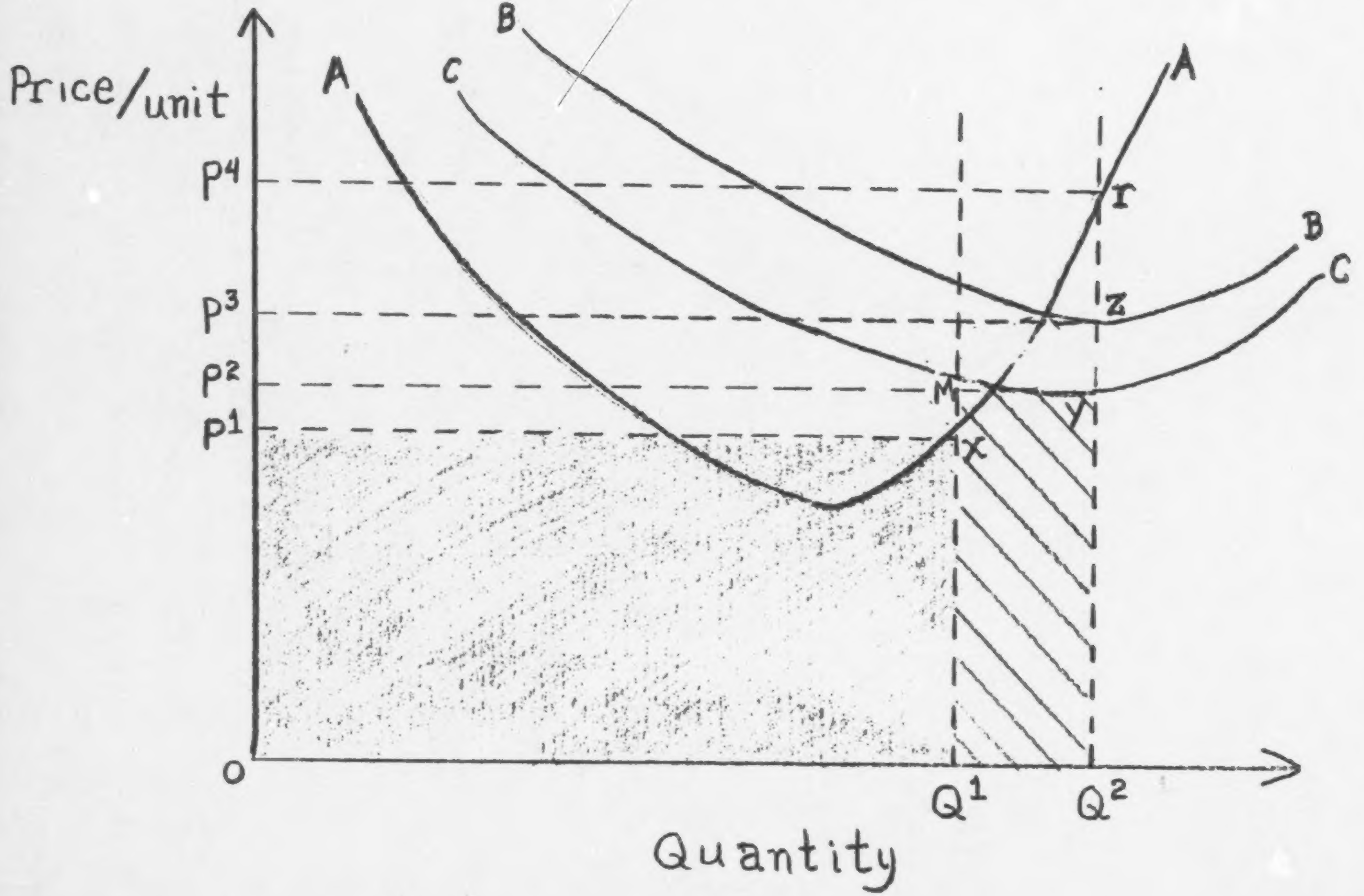
The utility, by contrast, is influenced by the financial treatment of the revenue requirement. If all costs of the building (B-B) or conserving (C-C) alternatives are expensed for ratemaking purposes, the utility is indifferent.[2] However, because costs of capacity construction are usually placed in the ratebase and earn a return for stockholders, the utility has an incentive to favor construction. In this example, even if unrepaid conservation subsidies were ratebased, the utility would still prefer the larger ratebase and revenue associated with construction (P^3-O-Q^2-z) rather than conservation (P^2-O-Q^2-y).

These contradictions highlight the allocational equity considerations surrounding the financing by utilities of residential

Figure 1

HYPOTHETICAL UTILITY PRODUCTION FUNCTION

AND UTILITY FINANCING



efficiency investments:

- Utilities may be relcutant to allocate collected revenue from paths which benefit shareholders to paths which benefit individual participating ratepayers.
- Participating ratepayers benefit at the relative expense of all other ratepayers in customer classes bearing the costs of programs.

The latter consideration allocates benefits among customers. The magnitude of this latter cross subsidy is determined by the applicable rate structure. With front-end customer charges and declining residential block rates in many states, this cross subsidy can be regressive when those with the highest consumption receive the greatest subsidy. The former consideration involves allocation of benefits between stockholders and customers. The equity aspects of the former situation depend on how the financing of such programs is composed, the debt/equity ratio of the utility, and the inclusion of costs in ratebase and consequent amortization schedules.

B. Financing

The equity aspects of project finance concern the allocation of benefits between shareholders of the utility and utility customers. There are two fundamentally different accounting methodologies to treat expenses incurred in the operation of a utility financing program.[4] Expenditures can be treated as a current expense, by charging them to the ratepayers when incurred. The utility earns no return (profit) on expenses and ratepayers incur no continuing financial obligation. Alternatively, investments in assets made by a utility can be placed in the ratebase and allowed to earn a percentage return for the utility. Ratebased assets are amortized over time.

Utility financing of conservation can be treated as either an expense or ratebased investment at the discretion of state utility regulators.[5] As a general postulation, for long-term financing investments, the cumulative costs of ratebasing exceed the costs of expensing.[6] This occurs for three reasons: (1) an investment keeps earning a fixed return every year it remains in ratebase, (2) a fixed profit is allowed for the company, and (3) because of tax impacts, as much as twice the actual fixed return must be charged to ratepayers. As a consequence, the fixed charge rate which electric utilities calculate when ratebasing the costs of new capacity results in ratepayers paying approximately $6 for every $1 of actual long-term conventional capital cost to the utility.[7]

Ratebase treatment, while spreading utility financing costs over many years, significantly increases total costs as compared to expensing costs directly in the year incurred. However, many utilities, understandably, are hesitant to devote capital to novel conservation financing projects unless that investment can earn a return similar to alternative investment options.[8] In essence, utility ratebasing allocates some of the benefits to shareholders rather than participating customers. This, in turn, raises the costs of the program, renders fewer and less extensive measures cost-effective and reduces total funds available for the program, *ceteris paribus*.

Moreover the constituent types of project finance affect the allocation of benefits and program costs. Debt and equity financing have different costs to a utility. Typically, utilities maintain a capital structure composed of about half equity (common and preferred stock) and half debt (bank and bond borrowing). In normal financial circumstances, the cost of equity exceeds the cost of debt. This occurs for two reasons:

- The return on common equity is higher than for debt.
- The return on equity, but not debt, is taxable to the utility, thus the before tax return must exceed the desired after tax return.

Therefore, in most situations the weighted cost of capital to operate a utility-financed conservation program will be less if the project is higly leveraged with a major debt component. This has the advantage for shareholders of minimizing dilution of shares and advantage for ratepayers of lowering the cost of capital to finance the program. Given normal financial conditions, it appears to be economically a pareto optimal solution, benefiting the interests of shareholders and ratepayers. It also equitably treats the interests of both groups.

In Case No. 59537, still pending before the California Public Utilities Commission, the economics and equity implications of alternative types of financing are clearly revealed. Table 7 illustrates three financing options for identical zero-interest conservation loan programs as proposed by Pacific Gas & Electric

Table 7

PG&E'S COST OF CAPITAL FOR CONSERVATION FINANCE:

ALTERNATIVE LEVERAGING ASSUMPTIONS

	Before-Tax Rate of Return	After-Tax Rate of Return	Percentage of Total Capitalization	Weighted Rate of Return
Rate-based (no leverage)				
Bonds	13%	13%	45%	5.85%
Preferred stock	13%	26.9%	14%	3.77%
Common stock	16.5%	33.8%	41%	13.86%
TOTAL				23.38%
Leveraged-bond debt				
Bonds	13%	13%	89%	11.57%
Preferred stock	13%	26.9%	2.8%	0.75%
Common stock	16.5%	33.8%	8.2%	2.77%
TOTAL				15.09%
Leveraged-bank debt				
Bank loans	14.3%	14.3%	80%	11.44%
Bonds	13%	13%	9%	1.17%
Preferred stock	13%	25.9%	2.8%	0.75%
Common stock	16.5%	33.8%	8.2%	2.77%
TOTAL				16.13%

Source: All costs of capital except bank loans from PG&E, Application 59537, Testimony of James T. Coudiet, Attachment A-3, bank loans from PG&E. Transmittal to Walter Cavagnaro re: Data Request of James Coudiet (June 10, 1980), Capital structures of 41% common, 14% preferred, 45% bonds and tax multiplier of 2.05 from Coudiet, Attachment A-2. Bond leveraging estimate from Application 59537, Testimony of Edward P. Kahn on behalf of the CEC staff, p. 15.

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Company (PG&E). Because PG&E's tax situation requires its before tax rate of return for equity to be multiplied by 2.05 to take account of tax obligations, a large equity component significantly inflates the total weighted cost of capital to operate the program.

Option 1, employing PG&E's existing capital structure of 45% debt/55% equity results in a 23.38% weighted cost of capital. Option 2, using 89% bonded debt/11% equity, reduces the weighted cost of capital to 15.09%. Option 3, substituting 80% bank debt into the debt constituent of option 2 results in a 16.13% weighted cost of capital.[9] As PG&E's expert financial witness, James Doudiet, stated in case 59537, a greater share of debt finance is preferable to a large equity component for purposes of structuring the least expensive financing option.[10] Because a less expensive program minimizes ratepayer costs, maximizes the cost-effectiveness of conservation measures, and allows the greatest amount of participation, it is equitable to ratepayers.

Footnotes

[1] Calif. Public Utilities Comm., Financing the Solar Transition, Jan. 1980, at 5-7, 16-18.

[2] This example assumes that both alternatives have identical or offsetting effects on utility bond ratings, stock book values, cash flows and regulatory treatment.

[3] Section 544 of the Energy Security Act amends NECPA to allow utilities to supply and finance residential conservation and renewable resources if installation is performed on a competitive basis by local installers. This prevents utilities from entering the installation business. Section 544 allows state utility commissions discretion as to the treatment of program costs of utility financing.

[4] Those expenses discussed herein are assumed not to be charged to individuals receiving the benefits.

[5] Energy Security Act, Section 544.

[6] Financing the Solar Transition, supra., at Appendix C.

[7] George Sterzinger, Second Generation Public Power, New England Regional Energy Project, at 5.

[8] However, there is some evidence that utility financing of conservation can tap the home improvement loan market, rather than conventional utility debt.

[9] Only under conditions where long-term bond interest rates are expected to fall quickly or when short-term interest rates are less than long-term rates, will bank debt be less costly than long-term bond finance.

[10] Calif. P.U.C. Case No. 59537, Transcript, at 1908.

III. Ratepayer Equity

Ratepayer equity is of concern in two important respects. First, because a program cannot immediately serve every customer, some will receive direct benefits while others do not participate in the program. If particular identifiable groups do not participate proportionally in the benefits of the program, the program is not equitable. Second, cross subsidies are created within and between customer classes in the operation of a utility financing program. The nature of these cross subsidies has equity implications.

A. Ratepayer Participation

An entire class(es) of customers is required to participate proportionately in the cost of utility financing through the payment of increased rates for service. The actual incidence of these costs is a function of the rate structure and individual consumption. In fact, a very small number of ratepayers will receive the direct benefits of utility financed conservation. California's landmark statewide utility-financed solar retrofit program is designed to reach only 2% of the gas-heated and 10% of the electrically-heated dwellings in the state. Almost by definition, many ratepayers directly subsidize a few beneficiaries.

If the utility reduces capacity expansion as a consequence, and cost-effectiveness estimates are accurate, the class of ratepayers is no worse off by virtue of financing this subsidy. There are three categories of ratepayers -- renters, low-income and elderly -- who historically have been less able to benefit from these types of programs. As a group, these three constituencies represent in excess of one-half the residential ratepayers nationwide. In urban areas, the fraction is much larger. If, as a subclass, these constituencies are forecast to not participate in utility financing programs, the program design will be inequitable as to these major urban constituencies.

1. Renters

Renters, for many of the reasons discussed in Part I, are a group which traditionally is not able to avail itself of the benefits of conservation programs. A Tennessee Valley Authority survey reveals that 94% of customers responding to a free energy audit were homeowners rather than renters.[1] Moreover, utility finance schemes have not been successful in reaching renters. PG&E operates a program to finance $500 customer loans at 8% interest for the installation of ceiling insulation. As of May, 1980, 7,163 loans were outstanding. However, only 0.03% of the loans were made to rental dwellings, and only 0.02% were made to multifamily dwellings.[2] Renters constitute 30% of PG&E's service population.

2. Low-Income Customers

The major barrier to low-income participation in conservation retrofit programs is access to capital at affordable terms. Many low-income homeowners do not have sufficient assets, income or credit history to obtain retrofit financing or obtain financing at affordable rates. However, a utility financing program can establish any terms: Loans can be sufficient to cover conservation costs, available to all customers, interest-free, and repayable at time of dwelling sale.

It is in society's direct interest to maximize cost-effective conservation investments. The most cost-effective conservation potential exists in totally uninsulated dwellings. Of single-family homes in 1976 lacking attic insulation, storm windows or doors, greater than 25% of the owner occupied homes and more than half of the rented dwellings were inhabited by low-income families.[3]

Yet, experience in California with PG&E's 8% financing program illustrates the potential to exclude low-income owners. First, PG&E has utilized customer bill payment histories as a creditworthiness criterion.[4] This practice effectively denies low-income persons access to the very efficiency improvements which would trim consumption and permit the prompt payment of charges. Past need becomes a present disqualifier for participation.

Second, financed program measures must be relevant to low-income homeowners needs. Financing replacement air-conditioners or swimming pool covers, as PG&E proposed,[5] is not relavant. Moreover, many low-income dwellings have structural irregularities, such as leaking roofs or broken windows, which require repair before accommodating insulation and weatherization.[6] From the perspective of performing cost-effective conservation, making these repairs to the building envelope along with insulation makes sense. However, because these repairs are necessary before thermal improvements, failure to include these building envelope repairs as eligible measures effectively disqualifies many low-income homes from participation.[7]

Third, with a limited amount of funds available for retrofits, maximum participation is itself a goal for an equitable program. The more conservation measures installed at ratepayer expense, the larger the benefit to the recipient.[8] Any program which places no limit on the amount of financing for large homes, or which permits second-home owners to retrofit several homes before others receive any utility financing, will inequitably disbenefit the poor in favor of the more affluent.

3. Elderly Homeowners

The elderly, who often have low income, traditionally have not participated proportionately in retrofit programs. A study by the Tennessee Valley Authority discovered that lack of knowledge and a fear of strangers coming into their homes were prime factors for the phenomenon.[9] Unless program design incorporates specific outreach mechanisms to transcend these barriers, a large market segment will not participate.

The dwellings of many of these three constituencies are the most cost-effective for financing. Inordinately large proportions of rental, low-income and elderly dwellings are under- or uninsulated.[10] Moreover, if one assumes that master metered multifamily units tend to consume more heating energy than their individually metered counterparts, then the absolute energy and dollar savings potentials in these units are greater than average. Moreover, the economics of scale in the retrofit of multifamily units makes them less costly per unit to retrofit. In sum, not reaching these constituencies denies the utility financing program its most cost-effective applications. For these ratepayers, it makes the program regressive.

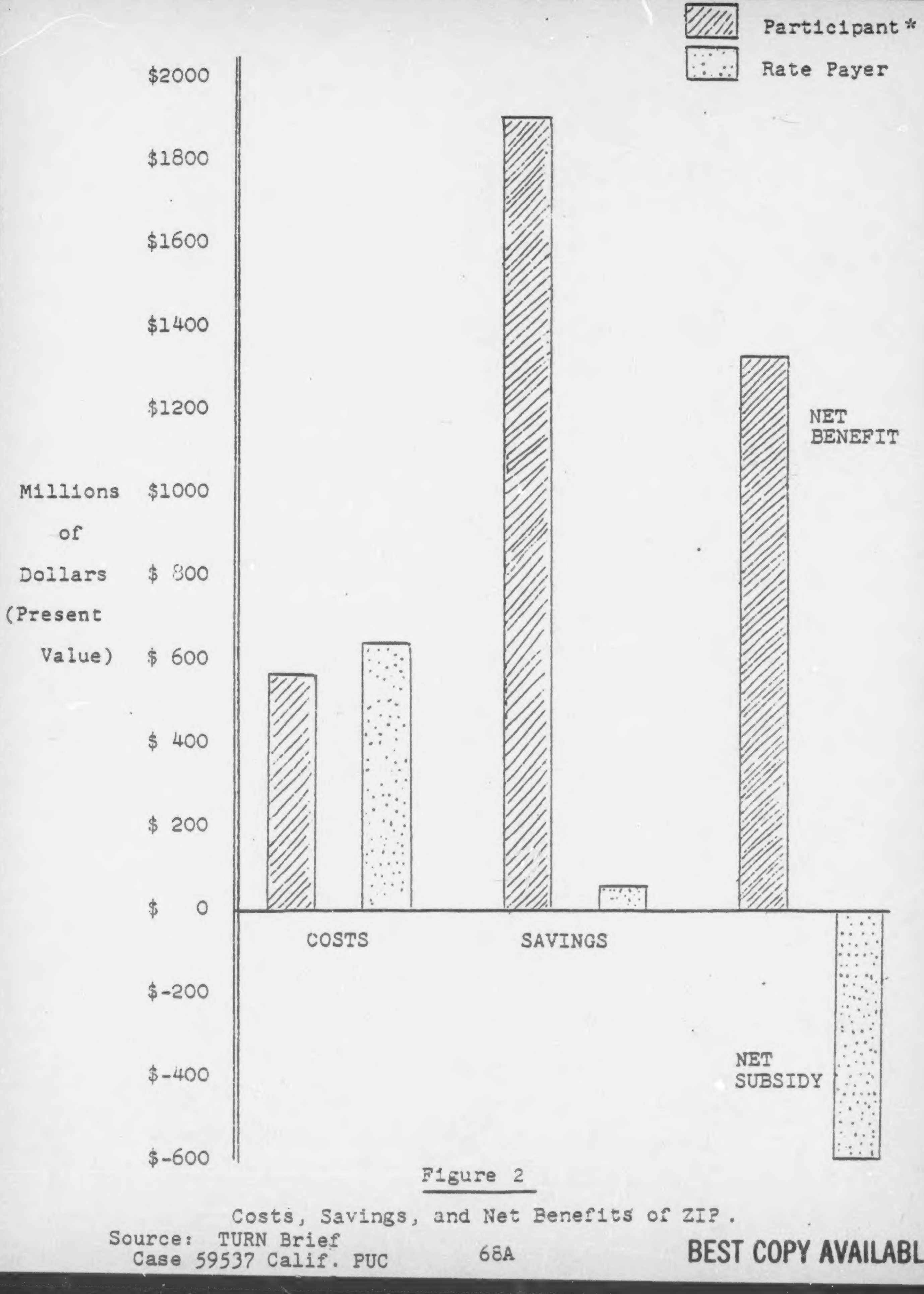

Figure 2

Costs, Savings, and Net Benefits of ZIP.

Source: TURN Brief
Case 59537 Calif. PUC

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of participants in the form of reduced utility bills. All ratepayers benefit somewhat ($60 million) from lower rates. Participants pay $585 million of loan principal, while all ratepayers bear $605 million in interest charges and administrative costs. The projected net benefit for participants of $783 million is achieved in part because of a $545 million subsidy from all ratepayers to program participants.

This example is for illustrative purposes only and is highly sensitive to rate structure and assumptions regarding the impacts of conservation on consumption patterns. Generalizing, as rates for conserved energy approach marginal cost of new supply, the benefit for all ratepayers diminishes or disappears.[12] While utility financing results in a cross-subsidy from ratepayers to participants, on balance it still is in the interests of all ratepayers if (1) it actually results in deferring capacity, (2) which is more expensive at the margin than the subsidized cost of conservation. For program equity, it is essential that non-participating ratepayers benefit.[13]

2. Current to Future Ratepayers

There is a time value to the costs and benefits of utility financing. Costs, in the form of subsidies for conservation investments, occur in the early years of a program. Benefits, in the form of reduced consumption, occur over a 20 year or more lifecycle. While, over 20 years, benefits may exceed costs, the breakeven point doesn't occur until well into the program.

PG&E believes that its proposal on a discounted present value basis will not break even until 14 years for electricity and 17 years for gas operations.[14] New capacity may not be deferred until well into the program. Therfore, current ratepayers subsidize benefits realized by future ratepayers. This can prove an issue particularly for senior citizens who may not be customers when the benefits are finally realized. For this equity reason, many state commissions prohibit the inclusion of construction work in progress on conventional facilities in utility ratebase.

3. Between Customer Classes

When capacity or fuel are conserved, they are available for consumption by others. If the new consumers are of a different customer class, a cross subsidy between these classes can result, depending on applicable rate structures. In California, PG&E proposed to allocate gas conserved in the residential sector by utility financing programs to interruptible industrial customers. The revenue requirement imposed on residential gas customers is increased by the utility-financing program.

The sale of this gas to industrial users produces revenue, but is offset by reduced sales revenue from newly conserving residential customers. The net effect depends on whether the industrial rate structure yields a price greater or less than the composite rates applicable to the residential gas conserved. If, as is often the case, industrial rates are less than residential rates, the resale of freed gas to industrial users creates a net revenue loss for the residential class and a consequent rate increase. This loss is a cross subsidy from residential to industrial users of gas. Given typical rate structures, this subsidy will be regressive.

4. Between Energy Sources

When utilities simultaneously supply two competing sources of energy, such as natural gas and electricity, cross subsidies can occur from one division's class of customers to the other's. This cross subsidy is wholly the consequence of rate allocations, and thus is within the control of state regulatory commissions. For example, if gas made available by utility-financed conservation is sold to the electric division at less than the cost of fuel it displaces, electric customers benefit from lowered fuel costs, while gas customers receive the benefits of less than the full marginal value of the sold gas. A witness in California Case No. 59537 calculated the present value of such a cross subsidy to electric customers over 30 years to equal $434 million.[15] Subsidizing electricity for heating does not constitute a cost-effective fuels policy. If gas is priced at its marginal cost, this cross subsidy disappears.

There is no utility rate structure which is perfectly equitable. Policy judgements and administrative conveniences cloud every service policy and rate structure. Federal policy[16] requires the purchase of surplus power from residential small power producers at full avoided cost to the utility, even though this results in a cross subsidy from all ratepayers to cogenerating ratepayers. Even though new residential customers cost the utility high marginal costs to serve, rates based on lower uniform average costs are charged. Utility financing must be judged on equity grounds within the ratemaking context and in light of its cost-effective value societally.

Footnotes

[1] Hemphill & Owens, *Burden Allocation and Electric Utility Rate Structures*, TVA, 1980, at 6.

[2] Calif. P.U.C. Case No. 59537, Transcript at 977.

[3] Yap, *et al.*, *Potential Effects and Administrative Feasibility of Energy Conservation Standards for Existing Homes*, Urban Inst., 1980, at 10-11.

[4] Calif. P.U.C. Case No. 59537, Trnascript, at 727.

[5] *Id.*, attachment A to Mertz testimony, at 4.

[6] In 1976, it was estimated that 5 million single family homes, owned mainly by lower income individuals, were substandard. Yap, *supra*., at 10.

[7] *Id.*, transcript at 704. PG&E contemplated making such repairs ineligible.

[8] *Id.*, transcript at 1423.

[9] Hemphill, *supra*., at 8-9.

[10] Yap, *supra*., at 9-10

[11] These calculations are taken entirely from PG&E's application and testimony in Case No. 59537. They are predicated on assumptions of the existing applicable residential rate structures. All data is from PG&E Exhibit 8, Attachments C-1, C-2, E; and Exhibit 27.

[12] Calif. P.U.C. Case No. 59537, transcript, at 1642-43.

[13] PG&E submits that the nonparticipant is benefited by the program contemplated by Application 59537. *See*, Reynolds, Exhibit 8, Att. C-1, C-2.

[14] Calif. P.U.C. Case No. 59537.

[15] Testimony of Dr. James Weil, Exhibit 40, at 13. There is reason to question the accuracy of this projection. Since May, 1980 the Commission has priced gas at the marginal cost of No. 6 fuel oil. Calif. P.U.C. Decision No. 91720, April 20, 1980.

[16] Public Utility Regulatory Policies Act, section 210.

IV. Equitable Program Design

There is nothing to prevent a utility financing program from being designed in an economic and equitable fashion. The economic strength of utility financing -- that it collectively taps the financial resources of all ratepayers -- is also its weakness: All ratepayers cannot simultaneously receive the direct benefits of the program. The temporal phasing of individual benefits, scaled against significant shared front-end program costs, dictates that all ratepayers cannot be treated equally.

However, inequality does not necessarily forebode inequity. Utility service and regulation is predicted upon broad approximations and averages. Notes former California utility Commissioner Leonard Ross:

> *"Anyone who starts from the assumption that existing utility rates reflect 2,500 years of Western concern for equity and justice is living in a world of dreams or bias."*[1]

The task in designing an equitable residential utility financing program is to ensure that no group of customers, because of housing type, metering, age, income or some other factor unrelated to desire to participate in utility financed conservation, is denied a proportionate opportunity to share in program benefits. That is, "suspect" classes of customers who are required to participate in program costs through increased rates, should be ensued by program design and operation of an equitable share of conservation. Absent such participation, an equitable program design requires that customer subclasses denied effective access not bear the cost burdens of the program.

If it can be demonstrated that inducements actually do motivate conservation and renewable investments, utility finance offers the potential to creat both an economic and equitable system of incentives. Only the utility, not an individual customer or customer class, experiences the marginal costs of alternative investment strategies. Under appropriate regulatory guidance, the utility can minimize, through subsidies for conservation, the long-run costs of utility supply. By targeting these subsidies to reach all types of customers, an equitable program can be created.

However, an investor-owned utility's service monopoly and bifurcated allegiance between shareholders and customers create profit-maximizing pressures which can distort program equity. Only careful regulatory oversight can prevent such distortions. Utilities, like most businesses, are in business to maximize net revenue and earn profits. Since ratemaking prospectively establishes rates, the actual performance of a utility can result in the collection of more or less revenue than anticipated. Thus, utilities are very sensitive to the quality of revenue (load) lost from conservation.

Residential rates in many states vary for different tiers of consumption. As Table 2 illustrates, PG&E, for example, maintains a steeply inverted three-tier rate structure with Tier 1 a low-cost lifeline rate for electricity and gas. For gas, Tiers 2 and 3 are both significantly above the company's marginal cost of gas. For electricity, Tier 2 is just below marginal cost while Tier 3 is significantly greater than marginal cost.

Assuming divisible production and the maintenance of existing rate structures, for every unit of energy a utility conserves, it saves its marginal cost and loses otherwise earned revenue. Again, with reference to Table 2, conserving a unit of gas from Tier 3 would cause the company to lose 67¢ while saving 47¢; a net loss of 20¢. Conversely, conserving a unit of gas otherwise sold to Tier 1 customers loses 29¢ of revenue while saving 47¢; a net gain of 18¢.

Table 2. PG&E Rate Tariffs and Marginal Cost for Electricity and Natural Gas

	Electricity(¢/kwh)	Gas (¢/therm)
Tier 1 (lifeline)		29
Tier 2	6.4	56.7
Tier 3	8.8	66.7
1980 marginal cost	7.22	47.2

Source: Testimony and Exhibits of Steven Reynolds, Pacific Gas & Electric Co., in Calif. P.U.C. Case No. 59537, 1980

As a profit-maximizing company, the utility clearly prefers to encourage conservation among Tier 1 customers. While the profile of customers in Tier 1 alters seasonally,[2] generally Tier 1 represents reduced consumption in small units or in already retrofit insulated dwellings. Therefore, the market incentive for the utility is to least prefer financing conservation in dwellings which have been unable to afford or accomplish conservation to date. Conversely in those many states with declining block residential rate structures, the utility revenue incentive would favor financing conservation in high consumption homes. Regardless of particular state rate structures, the market incentive for utilities is to "cream skim" by financing conservation in dwellings which consume in the lowest rate blocks, thus maximizing revenue and consequent utility rate increases.

If investment costs are ratebased, the utility will be tempted to overinvest in conservation hardware and minimize potential nonratebased maintenance expenses. This so-called "goldplating" increases the cross subsidy from nonparticipants to those receiving the benefits of utility financing and to company shareholders. Moreover, with decontrol of oil prices and phased deregulation of natural gas prices, the benefit to nonparticipating ratepayers shrinks towards nonexistence. With deregulation, as average costs increase towards marginal costs, the available benefit to the nonparticipant correspondingly decreases.[3]

The cost-effectiveness of utility financing, and the equity of subsidies provided depend on a number of assumptions regarding:

- escalation in utility costs
- types of fuels conserved
- the discount rate for customers of various incomes[4]
- conservation costs and savings
- turnover of housing stock
- repayment by customers of conservation principal
- consumer response to conservation improvements

This final assumption is particularly intriguing. It is commonly assumed that after conservation improvements a household will not alter its energy consumption habits. However, it is entirely possible that by virtue of resultant lower utility costs after conservation, a household actually will increase its consumption of utilities to purchase greater "comfort." If so, system savings and conservation cost-effectiveness will be less in fact than anticipated, and inequities can result.

Careful program modelling and design will avoid many of these uncertainties. Further, state utility regulation can prevent the "cream skimming" problem. To ensure that all groups participate equitably in a utility financed program, state commissions can earmark a share of program monies, target outreach measures,[5] or franchise to the utility rights to operate contingent on satisfying prerequisite conditions.[6] Targeted outreach could give preference to multifamily dwellings, low-income or senior customers, customers with high usage or facing termination of service.

Two additional measures reduce the cross subsidy required of nonparticipants. First, redirecting the goals of a program to achieve market saturation in a short period of time, perhaps by lessening individual subsidies, increases program equity. By increasing the number of participants, the costs of the program are spread among a large group of benificiaries. Second, by requiring principal repayment by a set time,[7] or providing principal amortization over the period of the loan, cross subsidies are minimized. In contrast, indexing principal repayment to time-of-sale can magnify subsidies. Given a seven-year average home turnover rate, one-third or more of loans could remain unrepaid after 10 years.[8] Creatively packaged, these techniques can mitigate many program inequities.

Footnotes

[1] Leonard Ross, "Utility Role in Financing Customer Conservation," in Energy Efficiency and the Utilities: New Direction, 1980, at 24.

[2] Because California's lifeline rates are seasonally adjusted to take account of winter heating requirements, data indicates approximately 80% of winter residential gas and electric sales are in Tier 1 blocks, while approximately 60% of summer residential gas and electric sales are within Tier 1.

[3] Calif. P.U.C. Case No. 59537, transcript, at 1332-33.

[4] Evidence suggests that low-income consumers perceive a higher than average discount rate, and thus require larger incentives to undertake conservation investments. See Hausman, "Individual Discount Rates and the Purchase and Utilization of Energy Using Durables," in Bell Journal of Economics, Spring 1979, 33.

[5] T.V.A. currently maintains specially targeted audit programs for senior citizens.

[6] A franchise concept would grant a utility the right to ratebase conservation investments in a certain number of homes after it certified that it has financed conservation improvements in a specified number of hard-to-reach (rental, low-income, elderly) dwellings. This has the advantege of internalizing equitable outreach as an integral element of utility operations. It also minimizes the need for regulatory intervention.

[7] Washington utilities finance conservation with a requirement of full principal repayment by the tenth year.

[8] The California Public Utilities Commission has calculated that 56% of California homes have been sold at least once after 7 years; 65% after 10 years, and less than 90% after 20 years. See Testimony of T. Keefe, Calif. P.U.C. Case No. 59537.

Working Paper No. 2

CASE STUDIES OF BUILDING ENERGY EFFICIENCY IN FIVE U.S. CITIES

Introduction (OTA)

Buffalo
Des Moines
Jersey City
San Antonio
Tampa

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Office of Technology Assessment

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a. Introduction:

The five case studies presented here are the full texts of the case studies which were included in condensed form in Chapter 10 of the first volume of the report Energy Efficiency of Buildings in Cities. The Office of Technology Assessment included these case studies to illustrate the local nature of the context which affects the energy efficiency of the building stock of a particular city.

In choosing these cities we avoided cities which already had a national reputation for ambitious energy efficiency programs and selected instead cities known for general vitality but not especially for energy programs. We wished to assess the importance of energy issues in such cities and to understand the political and administrative difficulties in putting together what energy conservation programs did exist.

We tried to select cities that were as varied as possible. Two of the cities (Buffalo and Des Moines) have very cold climates, one (Jersey City) has a moderately cold climate and two (Tampa and San Antonio) have hot climates. The cities range in size from Des Moines at 150,000 population to San Antonio, the country's tenth largest city at 700,000. Most of the residences in three of the cities are single-family homes but Buffalo and Jersey City have large proportions of multi-family buildings. Buildings in Jersey City are largely heated with fuel oil, most buildings in Tampa are heated with electricity while natural gas is the dominant fuel in Des Moines, Buffalo and San Antonio. Residential buildings are of frame construction in four of the cities; in Jersey City, however, they are of masonry. Only one of the cities (San Antonio) owns its own municipal utility. The rest are served by one or more investor-owned utilities.

Detailed information which compares the building stock, economics, fuel prices and types and government programs of all five cities is presented in Tables 84-88 in Chapter 10 of the full report.

Jane Silverman organized the case study interviews and went to each of the case study cities, accompanied by OTA staff members, Mary Procter (Buffalo, Tampa, San Antonio) or Nancy Naismith (Des Moines). We stayed 3 to 5 days in each city. The visits were scheduled to coincide with those of the Real Estate Research Corporation (RERC) team conducting interviews of building owners which form the basis of Chapter 4 of the full report. In each city we interviewed a set of people (other than the building owners) with an interest in building energy efficiency: city officials, state officials, administrators of federal energy programs such as weatherization, public interest groups, people engaged in energy conservation businesses and utility officials. The list of those interviewed is given at the end of the working paper. The site visit material was supplemented and updated by Census data and other quantitative information, as well as telephone interviews and written responses to specific queries by city officials and utility personnel in each of the cities.

First drafts of the case studies were written by Jane Silverman in the winter of 1981. They were sent for review to the six or seven people listed from each city in the front of the main body of the report. Final updating of information in each case study report was done in the fall of 1981.

BUFFALO

Buffalo is located in an economically depressed region and the highest priority civic issue for both citizens and government is economic development. The city has a high unemployment rate[1], and the backbone of Buffalo's current job base -- the automobile industry -- is an economic sector in great trouble. Buffalo does not have a particularly diversified economy and its white collar service sector is weak. Between 1975-79, 75 factories in the Buffalo area closed and some 17,000 jobs were eliminated.[2]

Other statistics about the city are equally bleak. Its population has declined from 462,768 to 359,965 between 1970-1977.[3] Of the city's total population, 11.2% households had incomes below the poverty line; and 18.9% were headed by persons 60 and over.[4] Buffalo has a deteriorated capital plant and a low "B" bond rating.[5] Slightly more than 19% of the city's commercial units were vacant, with the highest incidence of vacancy clustered in neighborhoods adjacent to Buffalo's downtown.[6]

Energy has been an important factor in this overall urban picture in several ways. Cheap energy helped make Buffalo an industrial leader earlier in the century, and economic development officials have looked to energy-related projects such as a Synfuels plant and a district heating system, as enterprises with economic development potential.[7]

Much more immediate, however, has been the impact of fuel prices on this primarily blue-collar city. Ninety percent of the homes in Buffalo are heated by gas, whose price as of February 1980 was 46¢/therm. Between 1974-1980, the average one-month bill more than doubled, according to data provided by the National Fuel Gas Distribution Corporation,[8] the region's major gas supplier. The small percentage of homes that use electric heat pay 6¢/kwh.[9]

These figures take on added significance given Buffalo's climate and the condition of its housing stock. The city is one of the windiest in the United States, and it is also quite cold. The mean January temperature hovers at 23 degrees.[10] The wind and chill have whipped through the wooden pre-war one and two-family frame houses that make up the bulk of Buffalo's housing stock.[11]

Given these facts, one would think that energy would be a hot political issue in Buffalo, but it is not. There are many explanations for this but the most commonly voiced one is that energy gets lost in the shuffle, given all the things that Buffalonians have on their minds. "Energy is not a big political issue here," says Tom Murphy, the Mayor's Energy Coordinator. People are aware of the high utility bills but they translate them more generally into larger economic problems, such as inflation and high food bills. The energy crisis is not publicly perceived as a problem." And adds John Garfield of the county energy office: "Of all the problems we had in the blizzard of 1977, energy was way down on the list; the same was true in 1978."

There are several energy conservation activities in Buffalo. These programs have been run by the city and county, the utilities, and some active public interest groups. The programs are quite fragmented, however, and individually small in scope. There are signs of greater interest in energy conservation particularly among city officials and the Common Council has passed a resolution targeting Community Development Block Grant funds for housing-related energy expenses.[12] While unemployment and an eroding tax base are still the primary civic issues in Buffalo, energy is moving up on the municipal agenda.

Energy Suppliers and Conservation

Ninety-five percent of the homes in Buffalo are heated by natural gas.[13] The average rate as of February 1980 for gas was 46¢/therm.[14] In 1980 average winter gas bills for Buffalo residents were $104 and average yearly bills were about $750.[15] A much smaller share of the homes in the city are heated by electricity, whose average cost (as of March 1981) was 6¢/kwh.[16] Average electric bills for January 1980 (based on 500 kwh) were $24, a 25% increase over 1975 bills.[17] The price of home heating and the frequent rate increases have placed a heavy burden on customers. National Fuel Gas notes that residential accounts in arrears grew from 65,823 in December 1977 to 91,294 in February 1981. During this period, the cost of gas to the consumer increased by about 55%.[18]

The suppliers of both gas and electricity have requested frequent rate increases since 1975. In the case of National Fuel Gas, while supplies are ample,[19] rate increases have been necessary, according to the utility, to cover the increased cost of wholesale natural gas and maintain a reasonable return on equity. Since 1975, while the cost of service has doubled to the customer, the base cost of gas has increased more than fivefold.[20] Niagara-Mohawk, the major electric utility, has requested rate increases to cover increased generating costs and the costs to construct the Nine Mile Island II nuclear plant in Oswego. In the fall of

1980, Niagara Mohawk requested a $245 million, 14% rate increase to cover these costs.[21]

"People relate the energy problem to the utilities," observes Energy Coordinator Tom Murphy. A public interest group, the Peoples Power Coalition, has been lobbying to establish a municipally-owned utility. While the Mayor has opposed such a move, the city's Common Council authorized $100,000 in February 1981 to hire a consultant to study the feasibility of setting up a municipal utility.[22]

Both National Fuel Gas and Niagara Mohawk maintain that they have an interest in conservation -- to maintain growth without additional capital expense, in the case of Niagara Mohawk, and to add to reserves, in the case of National Fuel Gas.[23] Under the New York State Home Insulation and Energy Conservation Act (HIECA), utilities are required to offer several levels of audits as well as low-interest financing. In Buffalo, this has meant audits ranging from a full-scale Class A survey to a do-it-yourself Class C audit, and seven-year loans up to $4500 for energy improvements at 11% in the case of National Fuel and 9.3% for Niagara Mohawk. The level of participation in the utility conservation programs has been low, however. Of 600,000 eligible homes throughout the state, only 0.32% of National Fuel Gas customers requested Class A and B audits. In the case of Niagara Mohawk, the figure was 0.60% of a total of 1,236,000 eligible customers. While these are statewide totals, the Buffalo percentages are believed to be quite similar.[24] The experience with HIECA loans is even smaller. Only 0.105% of National Fuel Gas and 0.159% of Niagara Mohawk customers took advantage of the loan program.[25]

Energy and the city's housing stock

The utility audit programs have been used primarily by middle and upper income residents, for these are the citizens who have the wherewithal to make improvements. According to National Fuel Gas, fewer than 5% of its customers who received audits were of low to low-moderate income.[26]

The HIECA program has not had a material impact in a city where 30% of the households had an annual income below $10,000[27] and where the median income in 1978 was approximately $12,000.[28] "The rising cost of energy cuts down on discretionary income," observes Tom Murphy, "and in Buffalo, food comes out of discretionary income. The one thing you have to do in this climate is heat your home." And adds Richard Coley, Director of Community Development for the Buffalo Savings Bank, "The majority of people I see don't need an energy tax credit or a write-off; they need cash." His point is underscored by a vignette described by Tom Murphy: "A man told me that he recently insulated his home. Now his wife sits wrapped in a blanket in the living room. She holds the fuel bill in one hand and the insulation bill in the other. 'I can't afford to pay either,' she says to him."

The problem is exacerbated by the poor quality of Buffalo's housing stock, 86% of which was built before 1939 and more than 50% of which is renter-occupied.[29] City officials estimate that about 95% of the homes in the city are wood-frame structures that are particularly subject to deterioration given Buffalo's climate.[30] The energy efficiency of these dwellings is also poor. In a final evaluation of the Erie County Residential Energy Assistance Program (REAP), the authors write: "Housing stock within Erie County is among the most inadequately insulated in New York

State. Nineteen percent of the homes have no attic insulation compared to a statewide average of 10%. Within the center city area. . . 45% of all single family homes have no known insulation."[31]

The combination of the high cost of heat, the poor housing stock, a large low-income population, and a harsh climate has helped raise interest in energy conservation on the part of city and county administrators, as well as public interest groups.

The City

The City has used Community Development Block Grant (CDBG) and federal rehabilitation funds for energy-related improvements in the single family housing stock and tax abatement for retrofit of multifamily programs.

In general, CDBG funds have been targeted toward downtown development and a few up-and-coming neighborhoods near the downtown that seem to be attracting middle class investors. Because of the city's limited discretionary income, the Mayor has been extremely leary of spending money on areas such as energy unless he can get specifically earmarked federal or state dollars for the purpose. Still the Buffalo Common Council adopted an energy policy[32] in December 1980 that, among other things, specifically targets a portion of the city's $24 million in CDBG funds toward energy conservation. As a result, the city is authorized to use CDBG funds to provide rehabilitation loans and grants to owners of one and two-family dwellings who have had an RCS audit and who have energy-related code violations. The resolution takes on added significance because it raises the importance given to energy conservation in the city extensive rehabilitation programs. This program has reflected the Mayor's overall interest in upgrading Buffalo's general physical image. As a result, code violations and exterior improvements have been assigned highest priority for rehabilitation funds. Only if money is left over, can funds be used for energy conservation. The December 1980 resolution now gives city housing officials official blessing to raise the emphasis given to energy conservation.

Since 1977, Buffalo has rehabilitated over 4400 homes with CDBG and Section 312 funds.[33] Until the program was discontinued, the city had the sixth largest allocation of Section 312 monies in the nation -- $2.6 million -- and approximately 300 homes were rehabilitated under this program alone.[34] About 80% of the rehab work on these 312 loan units included some minimal weatherization, as required by the HUD regulations for the program.

The city's basic rehabilitation program includes low-interest loans and grants (depending on income) of up to $5000 for home improvement activities. These loans are interest free and can be supplemented by bank loans, at prevailing interest rates, up to $20,000 for the total rehab financing. In addition, the city has made an interest free lump sum deposit of $3.2 million in CDBG funds at the Buffalo Savings Bank[35] to establish a revolving fund rehabilitation loan. In exchange for the interest free deposit, the bank has agreed to make 6% residential and commercial rehabilitation loans up to $10,000, and 9% loans for investor-owned properties, among other programs.

Roughly 13% of the city's housing stock (22,000 units) is in multifamily structures of 5 or more units.[36] The city has begun to use its tax authority to encourage retrofit in privately-owned multifamily buildings. Under the Section 235A Tax Abatement/Exemption program owners can receive relief from city taxes equal to 80% of the cost of energy conservation improvements only, over a period of ten years. Since November 1, 1980 when the program was started, eleven multiple dwelling owners (for a total of 202 units) have applied for tax relief under the program.[37]

The largest single multifamily landlord in the city is the Buffalo Municipal Housing Authority, with some 7500 units. The city has used a large portion of its modernization monies for insulation, improvements to the heating plant, installation of energy controls, and retrofitting of windows and doors in three large projects. In addition, the housing authority received a $200,000 grant from HUD, as part of a special energy conservation program, to install a Tri-fuel heating system in a 900-unit housing project in the city.[38]

The County

Erie County has also had a strong interest in improving the energy efficiency of the Buffalo housing stock.[39] In the division of functions between county and city, the city provides most public services, but the county is in charge of social services, especially welfare. In 1979, county residents on direct voucher energy assistance through the welfare program jumped from 4000 households to 10,000 households -- or 3% of all the households in the county. In 1980 the county had 49,000 low-income Energy Assistance Program recipients, the vast majority of which were in the city of Buffalo.[40] The county is responsible for raising 25% of the welfare share, so such a rise in demand for welfare assistance surely has a large impact on the county budget. It is clearly in the county's interest to encourage programs such as weatherization which would help cut down on household energy costs and there has been some effort to coordinate county welfare payment activities with weatherization and housing rehabilitation. But the limited scope of these programs has also meant a limited impact on reducing the county's welfare-related energy costs.

The state returned much of its CSA/DOE weatherization allotment because the state office was unable to spend the monies. The minimal program funded under the federal weatherization program was plagued by problems in hiring supervisory personnel and poorly-trained CETA employees. Recognizing the great need for weatherization, particularly within the city, the Community Action Organization of Erie County turned to the city and began carrying out weatherization with CDBG funds. Overall, between the two programs about 1100 units were weatherized between 1977-1980.[41] Such cooperation between city and county housing programs has been highly unusual, however.

The county also received New York State Energy Research and Development Authority (NYSERDA) demonstration funds to coordinate community-wide weatherization programs with HIECA. Under this program, the County prepared a comprehensive Weatherization and Support Service Guide of available assistance programs and a universal referral form that matches client needs with a variety of local programs. The county also set up a "HEAT line" administered by United Way and Catholic Charities to refer applicants to weatherization and energy assistance programs. County staff have also tried to link audits with recipients of County fuel bill assistance under the program and to tie energy audits to CDBG rehabilitation work. During the one-year program, about 224 energy audits were requested by recipients of fuel bill assistance under the program, and about 120 audits a year are expected as a result of linking the audit requirement to CDBG rehab financing.[42]

Public Interest Groups

The County-run REAP program grew out of a demonstration project funded with County CETA-monies to the New York Public Interest Research Group (NYPIRG). Under the program, NYPIRG conducted audits and advised low-income residents on simple, inexpensive retrofits. About 1200 households were reached during 1977, the year the program was conducted.[43] Public interest groups, such as NYPIRG, have played an active role in encouraging energy conservation, particularly among low-income households in the city. For example, NYPIRG has also conducted an audit/energy education program for tenants of scattered site public housing, under contract with the Buffalo Municipal Housing Authority, and run energy conservation training programs for city and county housing inspectors and rehabilitation specialists. This program was funded by Community Development Block Grant funds. NYPIRG has also received a $28,000 loan from the city (funded through CDBG) to set up a storefront from which to run energy conservation and economic development activities for low-income residents.

The Buffalo Energy Project,[44] a citywide group composed of neighborhood representatives and energy professionals, such as architects and engineers, has also tried to increase energy conservation in low-income neighborhoods and has been advocating a block-by-block neighborhood conservation effort modeled on the Fitchburg, Massachusetts low-cost/no cost program. Thus far, this approach has not been adopted in Buffalo, however. More successful has been BEP's efforts to bring alternative energy sources, such as solar and wind power, to the city. BEP has worked with builders of a 99-unit luxury townhouse development on the waterfront to develop passive solar designs for the units.

Interest in energy conservation among Buffalo residents has started slowly but seems to be building, partly as a result of the vocal activities of citizen groups, such as NYPIRG and BEP. City and county officials also seem to be more interested in committing specific public funds to what is clearly a pressing community issue. At present, with the exception of the County demonstration program, conservation efforts by various entities are not well-coordinated at all. The result is a fragmented, scatter-shot approach to energy issues rather than the city-wide, comprehensive approach that groups such as BEP and NYPIRG have advocated. "The biggest problem," says Ken Sherman of NYPIRG, "is the inability of the city to conceptualize the problem. We need a structure, a mechanism for policy."

Conservation in municipal operations

The adoption of an energy policy by the City Council in 1981 has been a small, but important step, toward pulling together the city's energy programs into a comprehensive strategy. Much of this policy has been directed toward improving tne energy efficiency of city buildings and city operations.[45] Buffalo's municipal buildings are old and energy-efficient. In 1980, $4.5 million was spent in heating and cooling municipal buildings, and despite substantial reductions in fuel consumption by all city agencies, energy expenditures have risen to the point where they are now 11% of the city's operating budget.[46]

The city has received federal public works money to retrofit city hall, the city hall annex, and the court complex. The work has included computerized controls, new roofs and some new windows. The city has also applied for federal technical assistance funds to perform audits on municipal buildings. When new roofs are installed on any city building, extra insulation is added as a matter of course and, says the city's chief architect, Bob O'Hara, "anytime we update a building we try to make energy improvements." But he concedes that energy improvements are "way down the pecking order" when it comes time to draw up the capital budget. Buffalo has a deteriorated capital plant and local officials have placed first priority on improving the city's infrastructure. Voters have not been particularly supportive of energy improvements if it means further demands on taxes and have rejected two separate bond referendum municipal retrofits. And while high city officials, right up to the Mayor, underscore the impact of rising energy costs on the municipal budget, there has been little effort to offer either carrots or sticks to department heads to cut back on energy usage.

On a smaller scale, the school budget has reflected many of the same sorts of problems as the overall city budget, but it has been helped somewhat by $4 million of federal public works funds, which the city opted to spread throughout the school system for retrofitting.[47] Thus, the school board has been able to make many of the capital improvements that the city could not afford to program. Even so, the Board of Education has been faced with a constricted budget, reduced state aid, and rising energy costs. Between 1979-81, for example, electricity grew from $11.70 to $17.84/MM BTU, and natural gas from $2.50 to $4.00.

Downtown Development

Mayor James D. Griffin has attacked the city's economic problems with boundless optimism and an aggressive development plan, that emphasizes both jobs and downtown revitalization. The visible signs of new building in Buffalo have helped raise the spirits of many local residents and give them tangible evidence that Buffalo may be turning around. HUD approved a $16.5 million UDAG for a new Hyatt Hotel and two bank buildings in the heart of downtown. Last year, a Hilton Hotel opened in the city and Buffalo has ambitious plans for the redevelopment of its waterfront, theatre district and the planned $450 million light rail rapid transit corridor. Several insurance companies, among others, have signed up as tenants in two of the new waterfront office buildings. These are now 95% leased and a third building is under construction. The City has also received EDA and DOE funds for a small wind energy conversion system to provide energy for a parking/tourist facility at the waterfront's Naval Park. The Greater Buffalo Development Foundation, a downtown improvement group, has spearheaded efforts to take a 23% occupied public housing project -- Ellicott Mall -- adjacent to the central business district and turn it into a model mixed income and mixed use project. Included in the plans is extensive use of heat pumps and solar back-up.[48]

The growth in new downtown office space has helped spur some modest energy improvements.[49] For office building owners, energy efficiency has been an important marketing feature -- particularly for "Class B" buildings which have to try harder to maintain their competitive edge in an economic climate such as Buffalo's. Some owners of older commercial buildings in the city are worried by the potential success of downtown revitalization in Buffalo. Many of the new buildings have been subsidized through UDAG's or Industrial Development Bonds, and there is a sense that Buffalo's already soft market is being overbuilt at the expense of existing building owners. "How can the government subsidize new office construction in a soft market and expect older buildings to be able to afford a major capital improvement in building energy systems?" asks one office manager.

Despite these caveats there have been some notable energy conservation leaders among Buffalo's downtown commercial buildings. Many of the office, retail and hotel buildings in Buffalo have made the key operational improvements, such as upgrading systems, boiler and lighting cycling, and more efficient flue dampers, that could help reduce energy costs. The new Channel 7 building has 32 separate heat pumps in a closed loop heat pump system. The old Marine Midland Bank Building has gone to the capital expense of retrofitting all of its windows on the wind exposure facade. And coupled with the new energy efficient Erie County office building and the solar units on the waterfront townhouses, there are several visible signs of active and innovative energy conservation in Buffalo's downtown.

Conclusion

In Buffalo, the energy situation is closely tied to the general economic condition of the city and its environs. Energy has not been singled out as the culprit by either government or consumers in Buffalo.

It is generally viewed as one part of a much larger economic dilemma. In some cities, energy is attacked head-on; by reducing energy expenditures, there is more to spend on other things. For the most part, this has not been the attitude among Buffalo energy policymakers. Instead a strong Mayor has made a strong case for overall economic development as the key to the city's future and the first priority of his administration. The Mayor certainly recognizes that in a declining economy, the high cost of energy hurts more than ever. But his strategy has been not to address rising energy costs so much as to address more general economic decline. "The city's approach is to attack economic development issues and to bring more money to Buffalo. That is how we are attacking the energy problem," says Tom Murphy, the Mayor's Energy Coordinator. This philosophy is reflected in many areas of Buffalo civic life -- neighborhood revitalization which emphasizes attractive neighborhoods rather than more fuel efficient structures; development plans which place priority on downtown commercial expansion; and large capital projects, such as the light rail system and possibly the Synfuels plant. And it helps to explain why energy per se is only slowly taking on a higher priority on Buffalo's civic agenda.

FOOTNOTES

[1] Bureau of Labor Statistics. At the time of the site visit (Fall 1980) unemployment was close to 9%.

[2] City of Buffalo, Division of Economic Development.

[3] City of Buffalo, Division of Planning, Insight 1976, U.S. Census, 1970, as updated by R. L. Polk Company Profiles of Change.

[4] Ibid.

[5] Data provided by Thomas J. Murphy, City Energy Coordinator.

[6] Division of Planning, op. cit.

[7] Neither program has been funded.

[8] National Fuel Gas. Average rate as of February 1980. According to data provided by National Fuel Gas to OTA, the cost per Mcf based on a one-month bill of 30 Mcf went from $1.65 in December 1974 to $3.96 in December 1980.

[9] Niagara Mohawk Power Corporation. Average residential rate based on 500 kwh/month usage as of March 18, 1981 rates.

[10] U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1977.

[11] Information provided by Susan O'Connor, Director of Neighborhood Revitalization and members of her staff.

[12] City of Buffalo Energy Policy -- 1981, adopted by Buffalo Common Council December 23, 1980.

[13] 1970 Census, Detailed Housing Characteristics.

[14] National Fuel Gas. See footnote 8.

[15] Based on estimates provided by National Fuel Gas and the New York Public Interest Research Group, in letter responses to OTA queries.

FOOTNOTES (continued)

[16] Niagara Mohawk Power Corporation, see footnote 9.

[17] Based on estimates provided by Niagara Mohawk Power Corporation and New York Public Interest Research Group.

[18] Data provided by National Fuel Gas in response to OTA queries.

[19] Based on interview with Daniel J. Stefaniak, Manager, Business Development, Heating and Conservation Services, National Fuel Gas.

[20] "NFG N.Y. Rate Increases Since 1966," National Fuel Gas, Research and Statistics, January 28, 1981.

[21] Based on interview with Richard V. Deptula, Assistant Service Superintendent, Niagara Mohawk Power Corporation and members of his staff.

[22] Based on interviews and materials provided by Thomas J. Murphy, Energy Coordinator, Office of the Mayor; and William Nowak, People's Power Coalition.

[23] Stefaniak and Deptula interviews, op. cit.

[24] NYPIRG Citizens Alliance, "A Drop in the Bucket: A Report on the New York Home Insulation and Energy Conservation Act," March 12, 1981.

[25] Ibid.

[26] Erie County, Department of Environment and Planning, "Erie County Residential Energy Assistance Program (REAP), Final Report.

[27] Ibid.

[28] Division of Planning, op. cit.

[29] 1970 Census, Detailed Housing Characteristics.

[30] Based on interview with Susan O'Connor, Director of Neighborhood Revitalization; and Richard Coley, Director of Community Development, Buffalo Savings Bank.

[31] REAP Final Report, op. cit.

[32] City of Buffalo Energy Policy, op. cit.

FOOTNOTES (continued)

[33] Buffalo Neighborhood Revitalization Program.

[34] Ibid.

[35] O'Connor and Coley interviews, op. cit.

[36] 1970 Census, Detailed Housing Characteristics.

[37] Section 235-A, Article II, Chapter XI, Ordinances of the City of Buffalo; and data provided by Tom Murphy, City Energy Coordinator.

[38] Based on interview with Walter Kubisty, Buffalo Municipal Housing Authority.

[39] Based on interview with John Garfield, Energy Coordinator, County Executive's Office.

[40] Erie County Department of Social Services.

[41] Material based on interviews with Julian Dargan, Executive Director, Community Action Organization of Erie County; as well as interviews with O'Connor, Garfield and Murphy, op. cit. Figures on weatherization volume provided by the New York State Department of State, Office of Economic Opportunity.

[42] REAP Program, final report, op. cit.

[43] Based on material provided by Ken Sherman, New York Public Interest Research Group; and John Garfield, op. cit.

[44] Based on interviews with John T. Moffitt and Robert Litzenburger, Buffalo Energy Project, as well as Tom Murphy and John Garfield, op. cit.

[45] Based on interviews with Robert O'Hara, Director of Buildings, City of Buffalo, and Tom Murphy.

[46] Data provided by Tom Murphy, City Energy Coordinator.

[47] Based on interview with Joseph F. Jones, Associate Superintendent, Plant Services and School Planning, Buffalo Board of Education.

[48] Based on interview with Gerald E. Kelly, Executive Vice President, Greater Buffalo Development Foundation, and Greater Buffalo Development Foundation, Annual Report, 1978/79.

[49] Real Estate Research Corporation, unpublished interviews with building owners as part of background study for OTA report.

Interviews: Buffalo

City Officials

James D. Griffin, Mayor, City of Buffalo

*Thomas J. Murphy, Energy Coordinator, Office of the Mayor

Susan O'Connor, Director of Neighborhood Revitalization

Robert Roessler, Department of Community Development

Walter Kubisty, Buffalo Municipal Housing Authority

Robert O'Hara, Director of Buildings

Joseph F. Jones, Associate Superintendent, Plant Services and School Planning, Buffalo Board of Education

James R. Militello, Director, Division of Economic Development

County Officials

*John Garfield, Energy Coordinator, County Executive's Office

Rodney W. Conrad, Project Manager, Office of Public Investment, Erie County Industrial Development Agency

Julian Dargan, Executive Director, Community Action Organization of Erie County, Inc.

Utilities and other energy suppliers

*Richard V. Deptula, Assistant Service Superintendent, Niagara Mohawk Power Corporation

Marvin Mednick, Consumer Advisor, Niagara Mohawk Power Corporation

Daniel J. Stefaniak, Manager, Business Development, Heating and Conservation Services, National Fuel Gas

Mark D. Pijacki, Supervisor, Research and Statistical Services, National Fuel Gas

Douglas Bradt, R. B. Newman Company, Heating Oil Distributors

Business and Finance

*Richard Coley, Assistant Secretary and Director of Community Development, Buffalo Savings Bank

*Gerald E. Kelly, Executive Vice President, Greater Buffalo Development Foundation

R. X. Hall, Director, Industrial Relations and Environmental Affairs, Buffalo Area Chamber of Commerce

*Arthur F. Worden, P.E., Wilson, Klaes, Brucker and Worden, Consulting Electrical and Mechanical Engineers

David T. Stieglitz, Partner, Stieglitz, Stieglitz, Tries, Architects

David T. Taggesell, Insulation Contractor

Joseph Hamilton, Director of Planning and Community Services, United Way of Buffalo and Erie County

Public Interest

*Kenneth E. Sherman, New York Public Interest Research Group, Inc.

John T. Moffitt, President, Buffalo Energy Project

*Robert Litzenburger, Buffalo Energy Project

William Nowak, People's Power Coalition

*Reviewers

DES MOINES

Attitudes toward energy conservation in Des Moines are the product of several contradictory factors. First is climate. Central Iowa is cold and windy. The mean January temperature is 19.4 degrees.[1] Energy-efficient buildings are a necessity in this cold environment. They are also increasingly an economic necessity. In January 1981, Iowa Power and Light put into effect a 14% electric rate increase and later in the year a 9% one. For the 107,000 electric customers, this has meant a 6¢ average kilowatt hour rate.[2]

At the same time, Des Moines is a prosperous midwest commercial center and is the headquarters for several publishing, insurance and financial firms. Median family income has been slightly over $10,000[3] and unemployment is low. On the other hand, local housing officials have said that as many as 20,000 (or close to one-third) of the city's households are in need of some sort of housing assistance. Roughly 4000 of these households are headed by elderly residents for whom the cold climate and rising electric bills are particularly problematic.[4]

Finally, there is the Des Moines housing stock. Local planners set the housing unit count at 73,000 in 1977 and estimate that 54% of these units were built before 1940. Furthermore, about 46% are in need of some sort of code-related repair.[5] On the other hand, while official surveys have never been made, it is the strong feeling of local housing, utility and lending officials, that most dwelling units in Des Moines have at least some minimal energy conservation features, such as insulation and storm windows.

Thus, despite the climate and the cost of energy, a strong vocal interest in energy conservation has not really been heard in Des Moines, except among a few public interest groups and city officials. This is not to say that nothing has been done. Quite the contrary. Business and homeowners have invested in at least a first level of energy improvements -- storm windows, insulation, computerized controls -- and there have been several successful, though small, neighborhood-based programs, run by the city in cooperation with environmental groups. The emphasis in Des Moines, however, has been on a quiet, self-reliant approach, with improvements financed privately or through self-help activities.

Energy Supply and Energy Cost

Overall, gas continues to be the dominant fuel in Des Moines when the total housing and commercial units are taken into account.[6] However, in recent years, the sharpest increase in new customer growth has been in electric sales. In 1980, for example, 65% of the construction in area was totally electric.

The utility seems well positioned to meet the projected demand for both gas and electricity. The utility's net generating capacity as of April 1981 was 1,492,000 kilowatts, most of which was provided by the Des Moines and Council Bluffs generating stations, with a combined net capacity of 982,000 kws. Iowa Power also has a long-term purchase agreement for one-half (or 400,000 kws.) of the Cooper Nuclear Generating Plant in Nebraska, and is a participant in two other generating plants which will come on line by 1990. The fuel use of these plants overall is 38% nuclear, 61% coal and 1% petroleum and natural gas. Overall, the electric generating capacity should be sufficient to meet the 3.5% annual growth rate projected by Iowa Power through 1990.[7]

Gas is provided by InterNorth (Northern Natural Gas), and gas supply through the next decade is also expected to be sufficient to meet the projected needs. Residential gas customers are expected to jump from 84,100 to 92,900 between 1980-1990, and commercial gas customers from 9200 - 9800, with a decline in industrial gas customers over this period.[8]

New generating capacity, repair and maintenance of the Cooper Nuclear Station and inflation have all contributed to rate increases for electricity by Iowa Power. In 1979 utility customers received a 19% increase in electric rates. Iowa Power then filed for a 30% increase which was scaled down to a 14% increase put into effect in January 1981 and a 9% increase later in the year. The main purpose of the 1981 increase was to cover general cost of service due to inflation, the company's share of the New Ottuma Generating plant and repairs and maintenance of the existing Cooper facility, according to the utility.[9]

Iowa Power also requested and was granted approval for gas rate increases during this period. In 1979 customers received a 5.3% increase and in 1981 a 6% increase. Most of these natural gas increases were due to annual pipeline adjustments, which have jumped from 3% in 1976 to 54% of the total customer bill in 1981, according to the utility.[10]

What these increases have meant for the consumer have been a jump from 1976-1981 of 4.09¢ kwh to 6¢/kwh for electricity and 16¢/therm to 38¢ a therm for natural gas.[11] Most of this increase has occurred since 1979.

If there is a silver-lining to these rate increases, it is that they appear to have spurred conservation, particularly among gas customers. Between 1970 and 1980, the utility added 15,000 gas customers but gas sales declined by 18%. During the same period, electric customers increased by 41,000 and so did electric sales -- by 60%. Between 1980 - 1990, the utility expects residential electric sales to continue to grow, by a rate of 37% and for gas sales to remain flat. During this period, the vast majority of new customers are expected to be for electricity.[12] Right now, however, gas continues to be the dominant fuel when all existing structures are considered, and the gains made in conservation among these customers are significant.

Energy Conservation: Residential homeowners and the business community

The best estimate of the extent of energy conservation in Des Moines comes from Iowa Power. Utility officials say that 50,000 residential customers have made some sort of energy improvements since the company first instituted its conservation program in 1973.[13] This is slightly over 25% of Iowa Power's total customers. According to E.E. Young, Vice President of Iowa Power, "The improvements run all the way from total weatherization, including upgrading of both ceiling and wall insulation, to do-it-yourself projects involving caulking, weatherstripping and other moderate home improvements." In addition, Young estimates that virtually all homes built since 1960 "are equipped with storm windows and doors and have some insulation in both sidewalls and attic." This would amount to 15% of Des Moines housing units, according to Census figures.[14]

Iowa Power offers a comprehensive audit to residential customers that request it and has encouraged more energy efficient features in new construction. It has encouraged the use of electric heat pumps in new construction and almost all new residential structures now have this feature, according to Young. The utility has also been monitoring energy use in demonstration solar homes in the Green Meadows Subdivision being built by the Pioneer Hybrid Seed Company near Des Moines. Additionally, the utility has offered loans for customers to switch from oil to propane. For a time, Iowa Power also offered 9%, three-year loans for insulation, although only about 3000 customers availed themselves of the financing.

One of the leaders in pushing conservation in the Des Moines area has been the Midland Financial Savings and Loan Association whose president, Richard L. Bryan, has been a zealous advocate of energy conservation both in Des Moines and in national savings and loan forums.[15] Starting in 1977, Midland Financial offered loans of up to $2000 at 1% below the market rate and, according to Bryan, "were willing to open-end existing first mortgages to accommodate energy retrofit needs of existing home loan customers." Current money market conditions have precluded the preferential rate but the S&L continues to aggressively market its energy improvement home loan package.

In addition, Midland Financial has developed an energy addendum to their appraisal form which outlines the basic energy concerns of a home. The fact sheet is used by appraisers both to evaluate specific energy loans and general home improvement and home purchase loans. On existing homes, the bank requires storm windows and doors in good condition, as well as adequate weatherstripping and caulking. They also require R-30 insulation in the attic and adequate ventilation. To underscore the importance of energy conservation, the bank gives each loan customer a caulking gun and tube at the time the loan is closed. Bryan makes clear that the S&L's policies stem not only from an interest in conservation for the public good but also because of sound lending practices. He says: "We're worried about households using both incomes for housing. Those people who are going to be hardpressed financially will have a little more money for use as a result of energy conservation."

Overall, Bryan estimates that 4000 Midland Financial customers have made energy improvements as a result of the lenders policies over a period of four years. In a normal year, the S&L makes about 1700 home improvement loans -- which is 30% of the loans made by Savings and Loans and 15% of the loans made by all lenders in Des Moines.[16] A sizable number of Midland Financial's customers in recent years, it would seem, have taken advantage of the energy conservation program.

Midland Financial represents only about 15% of the total lending in Des Moines, and other lenders have not been nearly so aggressive in pushing conservation. Iowa Des Moines National Bank, one of the largest financial institutions in the city, encourages home improvement loan applicants to make energy improvements, although it has not marketed energy as a special feature of its lending. The bank, which finances 75% of the new construction in the city also encourages homebuilders to be energy conscious, but the bank has not included special energy standards in its underwriting.[17]

There are no detailed figures on the extent of energy retrofit in commercial buildings, but interviews with building owners and local engineers indicate that many commercial property owners in the city have already made the basic capital improvements investments. Iowa Power does not conduct commercial audits on a regular basis but refers customers to private energy consulting firms. The Des Moines office market is extremely competitive and several new Class-A office buildings have recently been built or are under construction. This has put pressure on owners of older office buildings to make improvements, including energy, so that their properties can keep pace with the market.[18]

More than 20 examples of conservation improvements in the commercial and institutional sector have been documented in responses to a special survey published by the Des Moines Chamber of Commerce and widely distributed to local industry, commercial enterprises and educational and public institutions.[19] For the most part, the activities described in the report consist of better energy management, such as turning down thermostats and controlling lights and closing dampers, as well as better insulated walls and more energy efficient windows. At least one engineer who consults on energy matters for local businesses has reported a strong interest among his clients in control valves and heat pumps.[20]

There appears to be some interest in solar energy in Des Moines;. There are a few successful demonstrations of solar uses, including a large installation at the state capital complex, the demonstration homes at Green Meadows, and a few individual solar and underground homes. The Iowa Center for Local Self-Reliance and the city Office of Neighborhood

Development have also sponsored neighborhood workshops and demonstrations which have attracted as many as 1000 participants who have come to learn about home solar collectors. These workshops, generally neighborhood-based, have been widely publicized by local radio stations and newspapers, as well as through materials suppliers, such as lumber dealers.

While at least a first level of energy improvements seems to be widespread in Des Moines, several civic and government leaders have tried to further raise public consciousness about energy conservation. The City, particularly in the persona of the Plan and Zoning Commission Director, Robert Mickle, has taken on the role of public relations leader for energy conservation and, through various programs, has tried to fan interest in conservation. Mickle has been joined in his efforts by business leaders, such as Richard Bryan, and citizen groups. As part of the state energy month in September 1981, the city and business community sponsored a range of educational programs in schools and neighborhoods, as well as public lectures and exhibitions. The Des Moines Housing Council, a local group of business leaders, has also drawn together lenders, homebuilders, building suppliers, state and local officials and neighborhood groups, to discuss energy issues.[21] The Housing Council has been the catalyst for about 100 new homes in a low-moderate-income area of the city and has institutionalized energy efficiency criteria in their bid selection process.

In the spring of 1981, representatives from Des Moines and its surrounding communities began discussing specific community energy planning. There has been interest among Des Moines planners in developing a community energy management plan along the lines of Portland, Oregon.

Thus far, public support has been limited for such an approach, but the city's own comprehensive planning is trying to encourage energy efficient land use patterns.

Des Moines is a very low density city, with about 6.1 persons per acre. The city council's energy policy starts off with a set of policy objectives to encourage higher density residential and mixed use areas, particularly downtown and in the southeast quadrant of the city where much growth is occurring.[22] Part of this is just good planning, but it is also, to the mind of Mickle and his staff, good energy planning. For the most part, the land use policies in the city's overall growth plan for 1990-2000 link higher densities to mass transit and reduced dependence on the car as a way of getting at the energy problem. The lack of a good mass transit system is an important issue in Des Moines, which is heavily dependent on the car. The city is also encouraging the development of a downtown skywalk system to encourage pedestrian movement, particularly in Des Moines' cold winters.[23]

City planners are also energy conscious with respect to specific new construction in the city. Most of the new housing has been attached units, such as townhouses, and density levels in the city are going up. The city provides special density bonuses for energy-conscious site plans and makes energy conservation recommendations during the site review process for all projects.[24] The city building department already has authority to review the plans for new construction under the Iowa Building Code. The energy code, which was added to the state building code in January 1978, incorporates the ASHRAE Standard 90-75 for all new construction.[25]

Low- and Moderate-Income Housing

The combination of rising utility costs, extremely cold winters and an old frame housing stock has placed a heavy energy burden on Des Moines' poor. According to the 1978 Housing Assistance Plan, there are 20,000 households in the city in need of some form of housing assistance.[26] Forty-four percent of these households have elderly or handicapped members.[27] The high cost of energy has been particularly onerous for these older residents on fixed income. City neighborhood development officials estimate that such families are paying as much as 40% of their monthly income on energy in the winter months.[28]

The problem is compounded for lower-income households in the city because of the age and condition of the housing stock. Fifty-four percent of all occupied units in Des Moines were built before 1940.[29] According to the HAP, 46% of all units are in need of some sort of repair and 5% have major structural deficiencies. The poor tend to live in rental flats in these older wood-frame structures. There is a strong sense, though no actual data, that many of these older units that house low-income households are also poorly insulated.[30]

6300 households were assisted under the Low-Income Energy Assistance Program is Des Moines during 1980-1,[31] but this was less than 30% of the families that needed such aid. The toll of high energy costs can be seen graphically in the number of bad debt write-offs reported by Iowa Power and Light. Bad debts increased from $582,000 to $1,208,000 between 1978-1980.[32] In 1978 the Iowa State Commerce Commission instituted rules which forbade shut-offs on any day, between November 1 and April 1, in which the temperatures for that day or the day following was forecast to be below 20 degrees. The utility attributes this change in rules to the large increase in bad debts. Says a utility official: ". . .with the passage of the new rules and attendant publicity, more and more people let bills lapse and bad debt write-offs accelerated. Knowing that disconnects were forbidden convinced larger numbers of customers to withhold payment during the colder months and then simply to final service and change addresses."[33]

The city has tried to develop neighborhood-based energy assistance programs tied to retrofit and weatherization to supplement the direct cash assistance activities. The command center for these programs has been the City's Office of Neighborhood Development, with a staff person assigned as energy coordinator. In addition to LIEAP, the city's major energy assistance programs are the following:

-- Weatherization. The city originally contracted this program out to the Capital View Housing Center, which provide weatherization services to clients referred through the neighborhood offices in the prime service area designated by the city for neighborhood development. More recently, the program has been switched directly to the Office of Neighborhood Development, which processes the applications. CETA workers were used to perform the weatherization under the original program, and Capital View received authorization to use DOE monies for supervisory on-site staff to work with the less skilled CETA laborers. Under the new arrangement, the Office of Neighborhood Development sends the applications to the Office of Urban Development,which does the work write-ups and bids out the jobs in groups of five or six. Throughout the program, energy assistance recipients have been automatically referred and cross-matched with the weatherization program. Overall, since the program began, more than 1615 homes have been weatherized.[34]

-- Project Retrofit.[35] 120 of the homes weatherized under the Capital View Housing program have received additional improvements -- vent dampers, water-saving showerheads, and insulation of water heaters -- through Project Retrofit. The project is targeted towards elderly or handicapped households and is being run by the Iowa Center for Local Self-Reliance. Project Retrofit is a demonstration program to test the efficacy of various energy conservation measures. Forty homes have received a low-cost/no-cost package, including additional caulking; water-saving showerheads; and insulation of the water heater. Forty have received modifications to improve furnace and water heater efficiency (e.g., vent dampers). Forty have received both types of modifications. A fourth group of 40 homes serves as a control group. Overall, the project hopes to achieve a 15-25% reduction in energy costs above and beyond weatherization efficiencies.

-- Solar Greenhouse Project. The Office of Neighborhood Development received a $1,500 grant from the National Center for Appropriate Technology (plus $1,000 from CSA) to build a solar greenhouse onto the Southeast Community Center. The greenhouse is used primarily for growing seeds for the City Garden Project, and was built by neighborhood residents themselves as a demonstration of solar energy construction and application. It has spurred other workshops on solar energy throughout the city. Attendance at these workshops has been reasonably good (as many as 100 people), although there has not been much actual solar development at the neighborhood level.

-- Project H.E.A.T. The Office of Neighborhood Development has given a small contract to the Iowa Center for Local Self-Reliance to run a series of workshops in the fall of 1981 throughout the city in community centers and private homes on low-cost/no-cost energy improvements. 450 people attended the eight workshops and 287 low-cost conservation kits were distributed.

Aside from these programs, the city is not directing other federal or local funds specifically toward energy conservation, but some energy-related improvements have been a byproduct of the city's general rehabilitation activities. The city has had two rehabilitation programs: the Section 312 loan program, under which 157 homes were rehabilitated between 1977-1980; and a CDBG grant program for supplemental repairs to help homeowners correct specific housing problems. During 1977-1980, 288 homes received such grants.[36]

"These funds are pretty well stretched," says Barb Ashton, the Energy Coordinator for the Office of Neighborhood Development, "and when it comes to housing, are used primarily for code enforcement and maintenance." But Lance Decker, the former rehabilitation director for the city notes: "We count energy conservation as part of the code." This means that storm windows and ceiling insulation are given high priority under the city program and boiler improvements, while less high priority, are encouraged to the extent that they are feasible within the $10,000 loan limitation. The rehab staff also looks at energy costs in evaluating loans under the Section 312 program more generally, and federal regulations set energy conservation standards for rehabilitation under the 312 program.[37]

A much smaller housing rehab program, under Neighborhood Housing Services,[38] has tried to market energy conservation more aggressively but interest among the NHS area's large homeowners, and moderate-income elderly population has been minimal. Linda Wheaton, the director of the Des Moines NHS program, has offered free furnace inspections and energy audits but says," We've gotten very few calls for either." The loans under her program are used only for home improvements tied to code enforcement, but she senses that in several cases, the money has been used for small energy improvements, such as caulking and weatherstripping. "We have difficulty convincing older people who already own their homes to go further into debt," she observes. Usually the NHS staff tries to refer homeowners with energy-related repairs to the city weatherization program.

Des Moines is unusual in that its HUD community development and its CSA community action programs are administered on a citywide basis out of the same office.[39] Theoretically, this should make it easier to coordinate weatherization and LIEAP assistance with other rehab programs. In reality, however, only about 1% of the units under the weatherization program have received other rehabilitation assistance under the city's programs.[40]

The city would like to expand its energy activities to the extent that funding is available and it is likely that, through the new interest under the rehab program in energy conservation, that more of the lower-income housing stock will be reached. The city's overall housing plan for 1990-2000 includes a specific objective to "encourage owners of existing housing to add the needed amount of insulation" and recommends low interest loans of up to $500 to low-income property owners for this purpose.[41] So far, however, that remains a recommendation, not a funded program.

Government Energy Use

Building and street lighting energy expenses are second only to personnel in Des Moines' operating budget. The city's street lighting bill came to $1,942,000 in 1980 and has increased as a result of Iowa Power's rate increases since then.[42] While Des Moines is not in the same serious straits as many other cities, rising costs and declining tax revenues have affected its fiscal stance. Between 1970-1975, Des Moines lost an estimated 6500 people, and the city's population declined by 3.6%.[43] This population exodus, mostly to outlying suburbs, has been reflected in declining property taxes. High gasoline costs have also resulted in a decline in product sales that generate road use taxes, an important revenue source to the city. Such funds are used by Des Moines for street repairs and other maintenance. State law placed a 6% limit on growth in assessed valuation for 1980-81 and a 4% limit in 1981-82. As a result, the city has been forced to use general revenue sharing funds, normally reserved for capital improvements, for its operating budget.[44] This means less money to make some of the capital investment that would improve the energy efficiency of city buildings and bolster the budget.

"Energy has become a high priority financial issue," says Jerry Pecinovsky, the former assistant city manager, "and every city department is now convinced there is a problem." In 1979 the city council passed a set of energy conservation goals and objectives, which were really a set of broad-brush policy benchmarks rather than numerical goals.[45] That same year the city manager set up an energy committee under his office to monitor progress in energy conservation. The Manager's Energy Policy Committee consists of the city engineer, traffic and transportation director, the Energy Resource Coordinator of the Office of Neighborhood Development, and is headed by the Director of the City Plan and Zoning Commission. A citizen representative from the Advisory Committee on Environmental Quality also is part of the group.

The committee has set specific goals for individual departments and established the incentive that less spent on energy means more spent on programs, and vice versa. "The direction has come from the top to save," says William E. Block, the city's Senior Architect. "It would be an embarrassment if departments did nothing." In fact, the response of department heads has been reasonably good and is neglected in more energy efficient equipment, such as smaller cars, and less wasteful operations. The city has purchased 8 subcompact cars for testing purposes and has estimated that an entire fleet of Chevettes and Valiants could save more than 225,000 gallons of gas a year. Eighteen new garbage packers are diesel powered with six more scheduled to enter the fleet. Bill Block has organized "building energy squads" to promote energy conservation in the Armory, City Hall and Municipal Court buildings. The squads are directed to get fellow workers to turn off lights and equipment and to spot building problems such as broken windows. The effect of these squads has been somewhat limited, however, and they have not really resulted in energy saving behavior on the part of most employees.[46]

City officials have placed more emphasis on building modifications than on behavior modifications.[47] The average middle-income Des Moines homeowner may have put in storm windows and insulation years ago to endure the cold winters, but the same cannot be said for many of Des Moines' municipal buildings. Typically, the biggest structures, such as City Hall, are the worst offenders. "Roofs are the big problem," says Bill Block, who oversees most of these capital improvements. The city reroofed six buildings and added insulation last year. The local government has also installed insulated glass windows on the second floor of city hall and put in both new windows and insulation in the Logan community center. The city has contracted with the Johnson Control Company to install computerized energy controls in the airport terminal, the armory, and the botanical center. The city expects a $168,000 net savings over a five-year period, based on an escalation of energy costs of 15% a year. Total cost of the system for the three buildings is $190,000. The five-year capital improvement program includes many other similar energy improvements, such as new roofs/insulation, boiler upgrading, and window replacements. Progress on this wish list, say city officials, will be limited because of lack of funds. For the most part, those improvements that have to be made anyway, such as new roofs, will be tied to energy, but others may have to be deferred.

Conclusion

Energy conservation is not a high priority issue on the urban agenda in Des Moines. Des Moines officials are energy conscious but nowhere to the extent of officials in places such as Portland and St. Pual. Energy conservation has not taken on the importance as a separate issue that it has in these other cities. Rather it is viewed as part of the city's general efforts toward good management and fiscal responsibility. There is very little political backing for more emphasis on energy as a political issue. The middle class, which is the majority of Des Moines, seems to be coping. Low-income neighborhoods have a strong voice in neighborhood development programs through the Central Advisory Board, but not in the city council chambers. While energy costs are seriously hurting many low-income households in Des Moines, general upgrading of the housing stock is a much more important issue. There is little feeling from any quarter in Des Moines that the government ought to be doing more. It appears as if city officials in Des Moines have defined the energy problem largely in terms of local government's rather traditional, circumscribed roles: managing its own municipal house and helping that segment of the population which lacks the resources to deal with rising costs of energy on its own. As for the majority of the households and businesses in Des Moines, they are reacting to rising energy costs by tightening their belts and lowering their thermostats and paying their own way when they make energy improvements -- in short, they are managing in their own self-reliant fashion, which is probably what would happen regardless of whether government was more or less involved.

FOOTNOTES

[1] U.S. Department of Commerce, Bureau of the Census, County and City Data Book, 1977.

[2] Iowa Power, memo from E. E. Young in response to OTA queries. April 17, 1981. Unpublished. Electric rates are 12-month averages as of September 30, 1981.

[3] County and City Data Book, op. cit. Median family income is based on 1969 figures.

[4] Office of Neighborhood Development, Comprehensive Plan of The Des Moines Neighborhood Development Program, 1981: Housing Assistance Plan. July 1980.

[5] Ibid.

[6] Iowa Power, op. cit. Electricity presently captures 13% of the residential and 10% of the commercial market.

[7] Ibid.

[8] Ibid.

[9] Ibid.

[10] Ibid.

[11] Ibid.

[12] Ibid.

[13] Iowa Power memo, op. cit.: Interview with E. E. Young, Iowa Power and Light Fuel Conservation Plan (undated).

[14] U.S. Department of Commerce, Bureau of the Census, 1970 Census, Detailed Housing Characteristics.

[15] The material about Midland Financial's conservation lending program is based on interviews with Richard L. Bryan, as well as his letter responses to OTA queries, April 6, 1981.

FOOTNOTES (continued)

[16] Richard L. Bryan, letter to OTA, April 6, 1981.

[17] Interview with Garland K. Carver, Executive Vice President, Iowa-Des Moines National Bank.

[18] Real Estate Research Corporation, unpublished interviews for OTA background report, "Energy Conservation and Existing City Buildings: Owners and Retrofit Investment."

[19] Greater Des Moines Chamber of Commerce, "Techniques in Energy Conservation as Initiated by the Private Business Sector," (undated).

[20] Interview with Thomas J. Van Hohn, P.E., Brooks Borg and Skiles, Architects and Engineers.

[21] Des Moines Housing Council, Inc., Energy Conservation in Housing Informational Session, Minutes, March 30, 1981.

[22] Des Moines Plan and Zoning Commission, "Energy Conservation Plan," October 1978.

[23] Des Moines City Plan and Zoning Commission, 1990/2000 Land Use Plan (proposed). July 1978.

[24] Interviews with staff of City Plan and Zoning Commission, especially Robert Mickle, Director; William E. Block, Senior Architect; and James M. Grant, Senior Planner.

[25] City Plan and Zoning Commission, "Energy Report," April 1980; Interview with Tad Wideman, Director, Building Department.

[26] Housing Assistance Plan, op. cit. Data based on 1970 Census and Des Moines Plan and Zoning Department updates.

[27] Ibid.

[28] Office of Neighborhood Development, "Report on Program Year 1982," December 1981; interview with Barbara J. Ashton, Energy Resource Coordinator, Office of Neighborhood Development.

[29] Detailed Housing Characteristics, op. cit.

FOOTNOTES (continued)

[30] Based on interviews with Ashton, op. cit., Robert King, Chairman, Central Advisory Board, Office of Neighborhood Development, and other city staff involved in neighborhood programs.

[31] Office of Neighborhood Development.

[32] Iowa Power memorandum to OTA, op. cit.

[33] Ibid.

[34] Figures provided by Office of Neighborhood Development. Also interviews with David Barnes, Executive Director, Capital View Housing Center; and Barbara J. Ashton.

[35] The following material is drawn from the Office of Neighborhood Development Report on Program Year 1982, as well as from interviews with Barbara J. Ashton and Craig Severance, Iowa Center for Local Self-Reliance.

[36] Office of Neighborhood Development.

[37] Interview with Lance Decker, Assistant Director for Neighborhood Conservation, Department of Urban Development.

[38] Interview with Linda Wheaton, Director, Neighborhood Housing Services.

[39] Wright, Richard et al., "Going Public: The City of Des Moines assumes a unique responsibility for its metropolitan community action programs," The Reporter, August 1980, Vol. 5 No. 5, (National Center for Community Action, Inc.).

[40] Barbara J. Ashton, letter response to OTA query.

[41] 1990/2000 Land Use Plan (proposed), op. cit.

[42] Iowa Power, op. cit.

[43] County and City Data Book, op. cit.

[44] City of Des Moines, Performance Goals and Objectives, 1980-1.

FOOTNOTES (continued)

[45] City of Des Moines, Energy Policies and Objectives, General Administration Policy 1-10, passed by City Council, April 2, 1979.

[46] Interview with William E. Block, Senior Architect, City Plan and Zoning Commission and Jerry Pecinovsky, Assistant City Manager.

[47] Based on interview with William E. Block; as well as City of Des Moines, Capital Improvements Program, 1980-1 - 1885-6.

Interviews: Des Moines

City Officials

Peter Crivaro, Mayor, Des Moines

Elaine Szmoniak, Member, Des Moines City Council

Jerry Pecinovsky, Assistant City Manager

*Robert Mickle, Director, City Plan and Zoning Commission

William E. Block, Senior Architect, City Plan and Zoning Commission

James M. Grant, Senior Planner, City Plan and Zoning Commission

*Barbara J. Ashton, Energy Resource Coordinator, Office of Neighborhood Development

Richard Wright, Director, Office of Neighborhood Development

Lance Decker, Assistant Director for Neighborhood Conservation, Department of Urban Development

Tad Wideman, Director, Building Department

David Barnes, Executive Director, Capital View Housing Center

State Officials

Edward J. Stanek, Chairman, Iowa Energy Policy Council

Patrick Lana, Weatherization Coordinator, Iowa Office for Planning and Programs

Utilities and other energy suppliers

*E. E. Young, Vice President, Iowa Power

Bill Coleman, Sales Manager, MacMillan Oil Company

Business and Financial

*Richard L. Bryan, President and Chairman of the Board, Des Moines Savings

Business and Financial (continued

Garland K. Carver, Executive Vice President, Iowa-Des Moines National Bank

William F. Landholt, Group Vice President, Real Estate Services, Iowa-Des Moines National Bank

Joan M. Crenshaw, Compliance Officer, Iowa-Des Moines National Bank

Scott C. Wilson, Urban Affairs Associate, Greater Des Moines Chamber of Commerce

Thomas J. Van Hon, P.E., Brooks Borg and Skiles, Architects and Engineers

George M. Mills, Owner, Mills Insulation Company

Linda Roberts, United Way of Greater Des Moines

*Linda Wheaton, Director, Neighborhood Housing Services

Public Interest

*Martha Hock, Citizens United for Responsive Energy (CURE)

*Craig Severance, Iowa Center for Local Self Reliance

Jean Williams, Chairperson, Advisory Committee on Environmental Quality

Robert King, Chairman, Central Advisory Board, Neighborhood Development

*Reviewers

JERSEY CITY

Jersey City is an aging industrial community across the river from Manhattan. More than half of the occupied housing units in the city are dependent on fuel oil as their heating source.[1] This is a fuel category that has experienced particularly heavy price increases in recent years.

The median family income in Jersey City in 1980 was $16,300, according to HUD. During the winter, fuel bills for Jersey City homes were typically $250 a month, up $50 from the previous year[2] -- a heavy burden in a city where officials estimate that 53.3% of all households in the city are low- or moderate-income.[3]

Furthermore, of the total 87,981 housing units in the city, 78% were built before 1940. Thirty percent of the housing stock is below standard condition, according to city housing officials. Of this 30%, the vast majority, 23,000, are rental units, primarily in small, old masonry and brick apartment houses.[4]

Rising energy prices, particularly for heating oil, have been reflected in increased heating complaints at City Hall, an avalanche of requests for public assistance to pay fuel bills, and rising arrearages and extensions of credit from oil vendors. Moreover, city officials are beginning to link increased abandonment in the city -- in 1980 the vacancy rate was almost 8%[5] -- to the high cost of heating fuel. "Rising energy prices are definitely a large factor in the deterioration of our housing stock," says Bruce Davis, who directs the city's Housing Clinic, "but how large is hard to estimate."

Overall improvement of the city's housing stock has been an important civic issue in Jersey City. The community is only ten minutes away from New York on the PATH lines and thus could capitalize on the overflow from New York's high priced apartment and office market. This has indeed happened in Hoboken, a neighboring municipality. The city is putting considerable effort into stabilizing and improving its housing stock and to redeveloping some of its prime land, particularly along the waterfront.

The consumer response to high oil prices

Jersey City is a solid moderate-low-income community, still primarily blue collar but with a growing immigrant population.[6] About 15% of the city's population is elderly.[7] Unemployment in the city has hovered near the 10% mark.[8]

Of the city's estimated 4600 households who require some sort of housing assistance, about 2200 were served under the federal ECAP program during 1980.[9] No figures are available for 1981, although city officials feel that applications rose dramatically that year.

While there are no overall city records on fuel accounts in arrears, there has been a noticeable increase in delinquent accounts by several fuel oil dealers.[10] At the same time, oil dealers have tightened up on their own credit terms to deal with rising and often unpredictable oil prices. "Higher prices mean we are watching our credit more closely," says one fuel dealer. "The balances are higher but the aging is less." Typically, oil dealers have a $200 minimum delivery -- C.O.D. -- although they may offer a deferred payment plan to a good customer. The oil vendor is caught in a squeeze and often has only a 10-day line of credit. These tough terms are passed right on to the consumer.

A major oil dealer says about 15% of his customers have requested energy audits, a figure matched by other energy suppliers in the city as well. By and large, however, interest in conservation, as measured by actual improvements to buildings has not been particularly high in the city. Oil suppliers report a strong response to upgrading the quality of oil burners, especially to more efficient flame retention burners, particularly among single family customers. One fuel dealer reported that almost 20% of his customers had converted to this type of burner. Another cited a steady rate of about 200 customers requesting flame retention burners in 1980 and 1981.[11]

Conversions to gas have not been particularly high. According to one dealer, it was around 2% of all customers, about normal the rate of customer attrition. Interest in alternative energy sources, such as solar energy, has been virtually nonexistent in the city, even though the orientation of many of the streets towards the south makes Jersey City physically a good location for solar equipment.

Energy and housing

The impact of energy on Jersey City's citizenry is exacerbated by the overall characteristics of the city's housing stock. This stock is largely old and renter-occupied -- mostly mid-size, pre-war brick apartment houses typical of many northeastern cities. The single and two family stock consists primarily of frame houses put up quickly to house the railroad workers who formed much of Jersey City's pre-war employment base.

Encouraging energy conservation in multifamily rental buildings is a difficult policy problem in any case. It is particularly thorny in a place such as Jersey City, where units are heated primarily by oil, whose price rises are unpredictable and where the rental market is extremely soft. The response of landlords in Jersey City to rising energy prices has not been to conserve; rather, it has been to let services and building condition decline.

Precise correlation between the increase in oil prices and the decline in well-maintained units does not exist, but there are plenty of intuitive judgments about the linkage on the part of housing professionals in the city. The dynamics are well-summarized by Wendy Wilson, a housing planner for the municipality: "Taxes and energy are the keys to abandonment in this city," she says. "What happens is that increased taxes and rising energy costs come at the same time that these older buildings are due for major repairs. But landlords can't jack the rents up because people are too poor. The smaller landlords are usually well in over their heads already and they don't know how to cope. They sell to the large absentee owners who cut services and the good tenants move out. And that's the beginning of the end." And Norman Walther, the city's CDBG grant manager adds, "With taxes you can plan ahead, but for energy it has been a month-to-month change. Building owners can't anticipate the impact and that's one of the reasons they are having such a hard time coping."

"Most of the heating systems went in with the buildings," says Dennis Ury, the former director of neighborhood preservation. That means that systems often are 40-50 years old. The typical multifamily building is also very poorly insulated, lacks storm windows, weatherstripping and other anti-filtration features. The problem is worst in the wooden multifamily stock where many of the city's elderly -- and poorest -- residents live. The response of landlords has been to avoid making improvements because they can't afford to capitalize them. The exception to this is those landlords who have bought brownstone or small apartment buildings more recently in "gentrifying" areas. More typically, however, landlords respond to energy cost increases by cutting back - or cutting off - tenants' heat. "The new trick," says Wendy Wilson, "is to turn the heat off at 6:00 p.m. after the inspectors are off-duty."

The typical landlord response to rising energy costs is graphically captured in the city's heating complaint log. In 1980, the city received 2400 phone calls about lack of heat; in 1981 it had jumped to 3360 calls.[12]

Jersey City housing officials have been trying to address the energy-related causes of abandonment and deterioration within the bounds of their limited resources, through both regulatory and incentive approaches. For example, the city has an extremely active housing court and housing clinic. Uncorrected code violations are referred to the housing court which can mete out reasonably stringent fines and remedies. In its first year, the court handled 3,122 code violations and levied fines close to $79,000. In some cases, the court will recommend that buildings be put into rent receivership. When this happens, the city collects rents and assigns them to repairs and rehabilitation, while the owner, denied of his rent roll until the violations are corrected, still must pay the mortgage and taxes. The threat of receivership has been sufficiently strong so that most owners referred to the receivership unit correct violations before receivership proceedings begin. But the receivership group will only consider those buildings whose tenant make-up and structural condition make them reasonably good candidates for a successful turnaround. That eliminates many of Jersey City's multifamily buildings.[13]

These regulatory programs have helped address problems in Jersey City's substandard housing stock but they are of limited value when the building's economics make it easier for the landlord to walk away from the property than to comply with the regulation. To help address some of the financial problems of multifamily building owners, Jersey City has programmed a large portion of its CDBG and housing funds to incentive programs for rehabilitation:

-- The Jersey City Redevelopment Agency[14] offers a 30% grant to home owners and owner-occupied 1-4 family properties, for correcting code violations and making major property improvements. Approximately 48,000 or 52% of the city's housing units fall into this category.[15] The maximum grant is $20,000 for a 4-family building. In three neighborhood preservation areas, the JCRA also offers a 50% matching grant for multifamily properties, whose tenant income does not exceed 120% of the Section 8 limits. The grant cannot exceed $500 per dwelling unit. Repairs under this program are for housing code violations, barrier removal, energy conservation, and cost-reduction measures, in that order. JCRA also administers 100% hardship grants and Section 312 loans, among other programs. Since the program began in 1975, about 950 loans and grants have been completed or are in process.

By and large this program has been oriented toward the small multifamily owner and has encouraged some energy conservation measures, especially storm windows and insulation. There are 57,000 units in the city in structures of 3 or more units -- mostly in small multifamily buildings.[16] When the program was first started, JCRA was allowed to give a 50% grant for upgrading heating systems but this has since been discontinued in favor of what one rehab official calls "the Catherine the Great approach to rehab" -- that is, more cosmetic, easily visible repairs. However, many owners who receive JCRA grants are using them to convert from oil to gas, according to Dennis Ury, the program's former director.

-- For units outside the city's 10 Neighborhood Strategy Areas, a Home Improvement Program (HIP) grant is available for owner-occupied 1-4 family properties.[17] The maximum amount of this financing is $1500 -- offered as an outright grant for very low-income households and as a 1-1 or 1-2 matching grant depending on income for others, although all eligible applicants must be under the Section 8 thresholds. For elderly and handicapped households, the amount of the grant is $3,000. The total HIP program is funded through $1.3 million in CDBG monies. It has not typically been used for energy improvements by most applicants. However, in 1981 the city has earmarked an additional $200,000 for $500 grants to be used specifically for energy conservation purposes.

-- The federally funded weatherization program, started in 1977, weatherized about 200 homes, according to city estimates. The program was first operated out of the Department of Human Resources, but was then shifted to the Jersey City Redevelopment Agency before federal funds cuts terminated activities. The average cost per unit was $480, although Sam Tsarinides, the program's director, claims $2000 is closer to what was really necessary to retrofit units in the city's energy inefficient stock. Jersey City weatherization officials found that storm windows were the most cost-effective weatherization measure and these were assigned first priority under the program. Insulation proved more difficult to install, particularly in the older rowhouse and brick buildings, and was of secondary importance under the program. Some weatherization work was done on multifamily buildings and there was an effort to coordinate the weatherization program with both the JCRA rehab loans and grants and the housing clinic. Another program, run by the Urban League,[19] used CETA employees to weatherize 125 units during 1980-81. These were primarily in 2 multifamily buildings, with the landlord providing material and the Urban League labor. This program, however, appears to have had very few linkages with cityrun housing rehab activities.

-- One of the more active energy conservation programs in the city has been run by the Housing Authority,[20] which received $4.6 million in energy conservation grants from HUD. The majority of this money has been used to retrofit windows in existing projects and to replace steam lines with new, insulated piping. The housing authority has also upgraded some boilers, but rather than convert from oil to gas, they have improved the efficiency of oil burners, reduced fuel use, and converted to less costly oil grades.

While several city officials link the overall deterioration of the city's housing stock partly to energy conservation, Jersey City's housing decline began well before the energy crisis and has its roots largely in economic and demographic changes. With 30% of the city's housing units considered in substandard condition, Jersey City has many claims, including energy conservation, on its housing and community development grant funds.

The city does not have discretionary funds to spend on energy improvements and every dollar allocated to energy is a dollar taken from another housing or general municipal need, in a city where there are many needs and few dollars. Says Steve Miller, the former energy coordinator for Jersey City, "Even if Congress passed an energy block grant, we probably would...not use it for housing. We'd use it for city-owned buildings and schools." The city has tried to hold firm against further tax increases and views the bolstering of the existing housing stock as a high priority. But energy has not been linked to this objective.

For the most part, the city's energy funds have been offered to low- and moderate-income residents and landlords on a matching grant basis.

Many potential applicants cannot afford to match the city's funds for energy improvements, even though they may clearly see the benefit. And a 50/50 match, such as that of the city's former boiler retrofit program, probably does not go deep enough to help many property owners.

Moreover, landlords claim that there is little incentive to improve their multifamily buildings, except in a few neighborhoods, given the overall rental market in Jersey City, which is primarily a low-income market. Furthermore, a large portion of the city's units are covered by the Rent Stabilization Law which has limited rent increases to 4% a year. Landlords can apply for a Hardship Increase if rents will enable them to meet the allowable 11½% return on equity under the ordinance.[21]

The city has also been hampered in dealing with the worst tenant heating problems by state bid requirements.[22] Housing officials have proposed that the city fill oil tanks and then bill the landlord when heat is cut off. The city would collect rents against a lien for the oil payments. The problem is that the state public contracts law requires that any contracts over $4500 have to be put out to competitive bid, a lengthy and cumbersome procedure. This makes it impractical for Jersey City to buy bulk fuel for such a program at the most cost-effective rate.

Energy and municipal priorities

In June 1978, Jersey City's then-mayor, Thomas F. X. Smith announced the formation of a municipal energy office and various other programs largely aimed at setting an example of energy conservation for the rest of the city. The program, announced with considerable fanfare, included establishment of municipal goals and priorities, an energy watcher program to report consumption and "energy abuses" in municipal offices, and the establishment of several citizen energy subcommittees in areas such as small business and energy education. The Mayor enlisted the help of the New Jersey Energy Research Institute in setting up the city's program.[23]

Today, very little of that program remains. The energy coordinator has left the city and he has not been replaced. His original energy assignment was only part-time and he had no authority to require energy conservation measures from city departments. All that is left of the energy office is a small energy extension program which runs education activities for business and in schools. The energy subcommittees do not meet although they still exist on paper. The energy squads have been dismantled and had a very poor success record in getting municipal employees to make the operational changes, such as taking out lightbulbs and lowering thermostats, that would have saved dollars.

The major activity from the city's perspective has been in retrofitting municipal buildings. The city's own properties are old and energy inefficient. The average age of municipal buildings is ten years old and some firehouses date from 1840.

The public works department and the municipal buildings subcommittee have tried to take energy conservation measures when capital improvements are made on municipal buildings.[24] New construction now has adequate insulation and when roofs are replaced insulation is added. Several boilers have been replaced as part of the city's overall maintenance program and new windows have been installed on some firehouses as a result of federal public works funds. The city has also converted 8 boilers from oil to gas. But by and large the city is quite limited in what it can do. "We can't afford to do the capital things," says Jack James of the public works department. "So we're limited to the human factors and there we are up against a stone wall." And Morris Slurzburg, the subcommittee chairman, adds bleakly: "We've got the ideas. What we don't have is the money."

To some degree, Mayor Smith's energy program was always more of a public relations maneuver than a solid program. He did not, for example, use energy as a lever for getting control of his budget and hold department heads to strict energy consumption goals as have mayors in other cities.[25]

But Jersey City's energy program was derailed by other factors, too. A major problem has been lack of money. The city has run a slight deficit and is limited in budget increases by a strict state cap law.

The city lacks the discretionary funds to spend on energy improvements, and will not spend money on energy unless the program is paid for by someone else -- direct grants, CETA, anti-poverty monies. Local officials are also not interested in matching grants, as the city cannot afford to make up its share. Says Paul J. Bryme, executive director of the Jersey City Economic Development Corporation: "Don't hit us with a matching requirement if you think energy is important. Grants don't mean anything if you need matching funds."

Even if funds were available, energy would still be low on the municipal agenda. Under Mayor Smith, the highest political priorities were crime prevention, economic development, stabilizing the tax rate and improving the housing stock. Those are still the major items on the municipal agenda.

Mayor Smith cut the tax rate from $52.06 per $1000 assessed valuation in 1977 to $47.30 in 1980.[26] At the same time, he has been trying to bring in ratables to the city to shore up an eroding tax base.

Mayor Smith helped bring about some ambitious redevelopment activities along the waterfront and elsewhere in the city. These are expected to bring new jobs to Jersey City and to bolster the housing stock. Some of these projects are beginning to take shape now, such as the rehabilitation of townhouses along Van Vorst Park, the award-winning Liberty Park, across from the Statue of Liberty, and the new industrial development in the shadow of the Pulaski Skyway.

PSEG is investigating the possibility of a district heating plant using thermal energy from a Jersey City power plant. The project is in the earliest feasibility stages and Jersey City is only one of several sites being considered by the utility.[27] However, PSEG officials note that to be successful in Jersey City, district heating would probably have to be tied closely to new developments, such as those proposed by the mayor. "The best clientele is new building," says a PSEG official. "They have to build heating facilities anyway. Older buildings don't." Thus, the viability of a district heating proposal is rather closely linked to the success of redevelopment in Jersey City. The two could certainly reinforce one another, but the district heating idea has figured only marginally in the city's own redevelopment plans. Local officials prefer to focus on more tangible, nearterm projects.

Some city officials, such as the former mayor, feel that by focusing on the broad problem -- the city's economy and redevelopment -- energy problems will fall into place. In an ideal world, they would love to tackle energy frontally, but budgetary realities force them to put first things first, and energy is not first. Others feel that energy is such an important issue that without addressing it head-on, nothing else will be successful. "The inability to deal with rising costs will destroy the housing stock," says John Nettleton, a former housing planner with the city. And adds Wendy Wilson: "40-50% of the abandonment in the city is directly related to energy." This is clearly the minority view, however.

Jersey City is a few years ahead of many American cities in feeling the impact of rising energy costs. While the correlation is not scientific, there does appear to be some relationship between the high cost of fuel and deteriorated housing, but the strength of the relationship is hard to define. Other cities, more dependent on other sources of fuel, such as natural gas, which are being deregulated now, will feel the pinch of rising fuel costs on housing and low-income populations. Many cities, like Jersey City, have limited fiscal resources to deal with such problems. Whether they can come up with more creative direct solutions to the energy problem or whether they will tackle energy obliquely by grappling with economic issues more generally remains to be seen. In any case, Jersey City may be a forewarning of things to come for many other places.

FOOTNOTES

[1] U.S. Bureau of the Census, 1970 Census, Detailed Housing Characteristics.

[2] This figure is based on estimates from McConnell Fuel Oil Company and Eagle Fuel Oil Company, two oil distributors that serve Jersey City.

[3] Jersey City Division of Planning, based on 1980 revised HUD estimates.

[4] Jersey City Division of Planning. Figures based on local surveys and updates of 1970 Census data.

[5] *Ibid.*

[6] City of Jersey City Community Development Block Grant Application, Community Development Block Grant Year VI Application, March 21, 1980.

[7] *Ibid.*

[8] Jersey City Division of Planning, *op. cit.*

[9] Estimates based on interview with city weatherization coordinator, Department of Human Services.

[10] McConnell Fuel Oil and Eagle Fuel Oil executive interviews, *op.cit.*

[11] *Ibid.*

[12] Jersey City Department of Building Inspections.

[13] Interviews with Ed Coleman, Assistant Administrator, Jersey City Housing Clinic-Resource Center; and Robert Kealy, former receivership program administrator.

[14] The description of the JCRA's program is based on interviews with Dennis W.Ury, Jr., former director of Neighborhood Preservation, Jersey City Redevelopment Agency, as well as printed material published by the JCRA on the programs.

FOOTNOTES (continued)

[15] Detailed Housing Characteristics, 1970 Census, op. cit.

[16] Ibid.

[17] Based on interview with Norman Walther, Program Director, Community Development Block Grant Program.

[18] City weatherization coordinator, op. cit.

[19] Based on interview with Elinora Watson, Urban League of Hudson County.

[20] Based on interviews with Jersey City Housing Authority officials.

[21] Department of Community Development Rent Leveling Board.

[22] Interview with Ed Coleman, op. cit.

[23] "Jersey City is Saving Energy--You Can Too," Steve Miller, New Jersey Municipalities, March 1980. The description of the mayor's program is also based on interviews with Steve Miller, the city's former energy coordinator; and Charles W. Lawrence, Executive Director, New Jersey Energy Research Institute.

[24] Based on interviews with John James, Director, Division of Facilities Maintenance; and Morris Slurzburg, Chairman, Mayor's Subcommittee on Energy Conservation in Municipal Buildings.

[25] See, for example, the Tampa and Des Moines case studies.

[26] Office of Finance, Jersey City 1980 Budget.

[27] C. R. Guerra, PSE&G Research Corporation, "PSE&G District Heating Project, Hudson Generating Station, Jersey City, N.J.," (undated); PSE&G Research Corporation, "District Heating and Cooling Systems for Communities Through Power Plant Retrofit Distribution Network," Volume I, Executive Summary, October 30, 1979.

Interviews: Jersey City

City Officials

*Steven Miller, Energy Coordinator, Office of the Mayor

*Sam Tsarinides, Weatherization Coordinator, Department of Human Services

Norman R. Walther, Program Director, Community Development Block Grant Program

Dennis W. Ury, Jr., Director of Neighborhood Preservation, Jersey City Redevelopment Agency

Karen Quinn, Office of the Mayor

Paul J. Byrne, Executive Director, Jersey City Economic Development Corporation

*Wendy Wilson, Assistant Planner, Division of Planning, Office of the Mayor

John James, Director, Division of Facilities Maintenance, Department of Public Works

Ed Coleman, Assistant Administrator, Jersey City Housing Clinic-Resource Center

Cathy Rubel, Energy Extension Service

Paul Clemente, Chief of Maintenance and Operations, Jersey City Housing Authority

Peter de Pasquale, Director of Engineering, Jersey City Housing Authority

Utilities and other energy suppliers

Frank E. Rehill, Area Manager, Governmental Affairs, Public Service Electric and Gas Company

L. P. Minigiello, Eagle Fuel Oil Company

*Harold A. Duncan, McConnell Fuel Oil Company

Business and Financial

Joseph Scibetta, Chairman, Mayor's Subcommittee on Energy Conservation in Small Businesses

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Public Interest

*Charles W. Lawrence, Executive Director, New Jersey Energy Research Institute

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*John S. Nettleton, Planner, Rick Cohen and Associates

Morris Slurzburg, Chairman, Mayor's Subcommittee on Energy Conservation in Municipal Buildings

*Reviewers

SAN ANTONIO

San Antonio is one of the nation's ten largest cities[1] and superficially is a booming Sunbelt community. Preliminary Census counts place the city's population at 785,410.[2] The city's population has grown by 20% since 1970, both because of annexation of surrounding communities and in-migration. Unemployment is low and the median family income, according to early 1980 estimates is $17,100.[3]

But San Antonio is a city of sharp contrasts. More than half of its residents are Mexican-American immigrants, and 8% of the city is black. The immigrant population has increased sharply in recent years.[4] Almost one-quarter of the city's households were below 125% of the poverty level, according to the 1970 Census.[5] The city's housing assistance plans notes that 45,500 households are in need of some form of housing assistance.[6] Twenty percent of the city's housing was built before 1970;[7] and 27% of all the housing units in the city are substandard, many of them seriously so.[8] While the economy of the city is becoming more diversified, the major economic base at the moment is tourism and services for the several military bases in the area. While these provide stable employment, the wage structure of such jobs is low. City economic development officials are trying to expand San Antonio's tourism industry and to lure new light industry that would be compatible with it.[9]

Both aspects of San Antonio--the expanding population and economy, as well as the high incidence of poverty--are important in assessing the role of energy conservation in the City. Energy use and the City's fiscal situation are also closely linked. One-third of San Antonio's municipal budget comes from the revenues of the City Public Service Board (CPS), a municipally-owned utility that is the sole provider of gas and electricity for city residents and businesses. The successful marketing of energy has helped pay for city services and keep the city's tax rate low. Furthermore, San Antonio had the second lowest electric and gas rates of the 25 largest U.S. cities, according to a recent survey.[11] Average gas and electric bills are 23.5¢/therm and 4.5¢/kwh, respectively.[12]

San Antonio's sultry climate means that the greatest demand for energy is in the summer. The city has a yearly average of 2994 cooling degree days[12a] and over 60% of the year-round housing units have air-conditioning.[12b] Still, average summer residential electric bills in 1981 ran about $38.[12c]

The important issues in San Antonio are maintaining the pace of growth and managing it, as well as keeping the costs of services as low as possible. In both cases energy plays an important role, one that has been increasingly sharpened in the last few years over CPS's participation in the South Texas Nuclear Project (STNP). CPS and the business community argue that the STNP is vital if the city is to be assured of a continuing source of relatively cheap fuel necessary for the expanding economy. Its opponents maintain that the rapidly escalating costs of the facility will result in burdensome utility costs, particularly for the city's poor, and that the money spent on the plant would be better invested in conservation activities. The STNP issue has sharpened the debate of the role of conservation in San Antonio more generally.

City Public Service[13]

The city of San Antonio purchased City Public Service from the American Light and Traction Company in 1942 to provide a revenue base for the city and stabilize the tax rate. Under the original Trust Indenture securing the $33,950,000 purchase by the city, management of the utility was vested in an independent board of trustees, consisting of five members, including the Mayor who is a permanent ex officio member. The board has complete authority for management and operation of the utility, with two important exceptions--the setting of rates and the issuance of bonds, both of which must be approved by the city council. Upon expiration of the Old Series Bonds in 1990, new indentures will change this structure somewhat. Henceforth, members of the CPS Board will have to be approved and in certain cases appointed by the City Council. The Council will also have authority to review CPS actions with respect to research, development and planning.[14]

While CPS operates very much like a private utility, the new indentures will make an already close relationship with the city even closer. The ordinances authorizing CPS bonds pledge revenues first to cover operation and maintenance and second to amortize the bonds themselves. Third, however, is a payment in lieu of taxes to the city, which is currently 11.8% of the utility's revenues. CPS's payment to the city can be up to 14% of electric revenues. The City Council has voluntarily limited the proportion of gas revenues it receives to 11%. This payment accounts for 35% of the city's total revenues and has enabled San Antonio to have a tax rate of .743 per $100. In fiscal 1980-81, the CPS contribution to the city was 52.6 million.[15] "We bought CPS to keep the property tax low and it has," says Shirl Thomas, an assistant to the Mayor. CPS's annual contribution to the city budget has allowed the city to maintain the same tax rate for the past seven years.

The city thus has an interest in both keeping rates low--it, after all is a consumer of gas and electricity--but also in assuring an adequate rate of return for the utility. While it is fairly common in most places to complain about rising utility costs, in reality San Antonians have not experienced excessive rate increase, nor are their utility costs particularly high, relative to the rest of the nation. Nationwide, San Antonio's typical residential electric bill is ranked about 43rd (with 1 being the highest) of 60 cities surveyed on a regular basis by the Jacksonville (Florida) Electric Authority.[16] Average residential energy charges as of July 1981 were 4.5¢/kwh for electricity and (as of September 1981) 23.5¢/therm, for gas, the lowest rates of the 5 cities studied.[17] Between 1970-1979, residential electric bills have about tripled and commercial and industrial bills have increased close to four-fold. But the jumps have been in very small increments, year by year, and San Antonio energy consumers have not been hit by the whopping 25% and 30% increases at one shot that have occurred in other places. Nor are they likely to be over the next 10 years. CPS projects rate increases of 5.5% on average through 1986.[18]

People do complain about rising utility costs in San Antonio but by and large they do not blame CPS. "Railroad people are blamed for the rising rates, not the utility," observes Howard Rogers, a local energy auditor. The reasons for this go back to 1972-1973 when Coastal States Gas Corporation and its subsidiary LoVaca Gathering Company defaulted on gas supply contracts to CPS. CPS moved quickly to develop alternatives to gas and in 1977 switched to coal for much of its generating fuel. By 1978-79 coal accounted for over half of CPS's generating fuel. In 1973, CPS committed itself to two 418 megawatt electric generating stations and to using western coal, partly because the freight rates to haul coal from Wyoming to San Antonio were considered low at $7.90 a ton.[20] Even though the capital costs for building these plants was higher than for equivalent gas/oil facilities, the low coal hauling rate would result in lower overall cost to the consumer, according to CPS's projections. Unfortunately, coal hauling rates have continued to rise. Between 1976-1982, coal hauling rates have more than doubled, from $10.93 in October 1976 to $26.16 in October 1982, and account for much of the increase in utility bills over this period.[21] Mayor Cockrell has spoken out sharply against these escalating hauling charges and made it one of the most vocal issues of her tenure. Her successor, Henny Cisneros, has also expressed concern over the coal hauling rates. The Staggers Rail Act of 1980 includes a controversial amendment that would limit future rate increases by Burlington Northern Railroad for hauling coal from Wyoming to Texas.

These events in the past have had important ramifications for the future. First of all, there is a lingering fear among area businesses that the LoVaca debacle might repeat itself. "The industrial user is scared that his use of gas will be regulated and the same with many commercial users," says Howard Rogers, a local energy consultant. "You'd be amazed at how many buildings are all electric." The utility also feels it has been twice burned--first by gas and more recently by coal--

and it is moving to further diversify its power sources. At present about half of CPS's generating fuel comes from natural gas and half from coal. However, CPS has a 28% share in the South Texas Nuclear Project (the other owners are Houston, Austin and Corpus Christi) and in 1984 and 1986, a 350 MW unit will each come on line, shifting as much as 40% of generation to nuclear. In 1990, CPS plans to add a 500 MW coal or lignite plant, if the lignite option is selected, it will be fueled from nearby fields; in Texas, some of which are owned by the utility. CPS projects a 5.71% growth rate over the next decade and has based its generating figures on a reserve margin of 10% of the high temperature peak, which by 1985 is expected to be about 2500 MW.[22]

The South Texas Nuclear Project has generated considerable opposition from environmental, consumer, and community action groups. Costs for the project have escalated sharply beyond the 900 million that was originally estimated and could go as high as $4.8 billion, largely because of construction delays. The city of Austin voted to authorize city officials to find buyers for its share of the project. San Antonio officials maintain the STNP project is still an attractive energy alternative but would question participation should there be any more major delays.[23] CPS officials say that principal and interest will amount to about 10% of overall rates and will not have an appreciable impact. Furthermore, says the utility, while short-run advantages of participation in STNP may not be apparent, over the long haul it will provide far cheaper energy than other sources. CPS officials have estimated the capital costs of nuclear through the STNP to be $2.94/kwh, as opposed to $1.88/kwh for lignite, $1.61/kwh for coal (new plants) and 0.45/kwh for combustion gas turbine. However, fuel costs are $.91/kwh for nuclear, $4.17/kwh for lignite, $5.85/kwh for coal and $12.09/kwh for combustion gas turbine. Overall, total costs are expected to be $4.35/kwh for nuclear, as opposed to 6.80/kwh for lignite, 8.24/kwh for coal and 13.11 for gas.[24]

Regardless of who is right or wrong in the debate, there are questions raised about whether CPS's capacity needs can best be met through new capital facilities or by other means, especially conservation. CPS has had an active conservation program since about 1972. It has included bill stuffers, public service announcements, school programs and energy conservation seminars. In 1978, the utility began to offer free Class A audits. During the first year of this service, about 3% of CPS's customers requested such surveys. Between 1972-77, utility executives estimate that CPS residential customers reduced their annual consumption from 9234 kwh to 7972 kwh, or approximately 14%.[25]

In addition, CPS residential and commercial rates are designed to promote efficient use of electrical facilities throughout the year. Thus, residential customers who consume less in the summer may benefit from a lower rate on some of their kwh usage during the winter months. Also, commercial customers who have demand meters are given rate incentives to reduce their peak demand during the summer months.

"In the face of curtailments by our natural gas supplier, CPS intensified its conservation efforts in early 1973," observes Jack Thornton of CPS. "And the conservation program is now a major focus of our consumer information activities." Nevertheless, utility officials feel that there are limitations to conservation as an alternative to new plants. Says Thornton: "While conservation may be very effective in reducing overall consumption of energy, its effectiveness in lowering the peak demand may have limits. While the peak demand may be somewhat lower, utilities will still need generating capacity that is sufficient to meet that peak demand. More importantly, prohibitions against future use of gas in boilers for the generation of electricity, as well as price and other considerations, make it prudent for CPS to diversify its generating capability."[26]

Furthermore, there does not seem to be much current interest among consumers in conservation. True, local real estate pages include many listings for new homes with energy saving features. In the existing housing market, however, there appears to be very little retrofitting going on, although no surveys of conservation measures have been made. Lenders do not have active energy conservation programs and have not noticed great interest among homeowners in energy improvements.[27]

Most energy improvements in commercial buildings have been operational or control-related, but there have been few notable examples of major capital investments. Syndicates and foreign buyers, who have invested heavily in the San Antonio market, have also shown little interest in energy improvements.[28] "People complain about their utility bills but they are not so much of a burden yet," says Boone Powell, a local architect who has designed several solar projects.

Targetting to the poor

One of the major arguments levelled against the utility's participation in the STNP is that much of the investment might be better spent upgrading the energy efficiency of homes in targetted areas. "I would like to see CPS do an impact analysis, before they add a new plant, of the cost of conservation versus the cost of building new capacity," says Deputy City Manager Lou Fox, "I'd like to see them commit so many loans in targetted areas."

According to the city's Housing Assistance Plan, 45,500 families are in need of housing aid.[29] More often than not, these families live in seriously dilapidated housing stock and 27% of the housing in the city is said to be substandard, according to local officials.[30] "98% of these homes are frame and everything leaks," says Winnie Doria, who heads the neighborhood rehab program for the San Antonio Development Agency (SADA), "and in the west part of the town, where the worst housing is, at least half these homes have single wall construction." In addition, many of these houses have unvented gas wall heaters which are both dangerous and inefficient. "You can't cool these units and they become a hot box," says Mike Garcia, of the Mexican American Unity County (MAUC), one of the leading neighborhood organizations in the city. So far-gone are most of these homes, that they have been dubbed "infeasible houses" and are torn down and replaced with new structures under SADA's replacement home program. Overall, city officials say there are 71,900 substandard units in the city.[31]

The city has used community development block grant funds primarily for hardware purposes, such as drainage, parks and streets. "There is pressure to spend money in the most visible way," says Rhea Korsh, a San Antonio community development official, "and energy is not visible."

Rehabilitation activities under the city program are contracted out to SADA, a quasi-independent agency, much like the Housing Authority. SADA has targetted its rehab programs to low and moderate-income areas that are 60% owner-occupied and where at least 60% of the housing is salvageable. The program offers 4% loans, grants (up to $10,000), and payment exemption loans provisions (PEP) loans (up to $13,500), in which repayment of the loan is made at the point of sale, if the new buyer has adequate income. SADA also makes emergency repair grants up to a maximum of $3500, and participates in HUD's Section 312 program. Between 1975-1980, SADA has given out 244 emergency repair loans, 617 CD rehab loans and grants, and 67 Section 312 loans.[32]

The priorities under the programs are "electric, roofing, plumbing, energy," says Winnie Doria, but in each case, the agency tries to include substantial energy improvement. SADA puts R-19 insulation in the attic as a matter of course and R-11 in the walls when feasible. All additions are insulated. Other repairs include weatherstripping, caulking, new or repaired doors and windows, roof turbine vents, and skirts on units on posts. SADA also has a replacement housing program for totally sub-standard units, in which the agency combines an outright grant and a PEP loan to build new 2-bedroom homes. 237 replacement units have been built or are under construction during the 1975-1980 period.[33]

The city originally contracted out the weatherization program[34] to MAUC who targetted it to the southwest sector of the city. The state was not eager to approve a program that only covered one sector of the city and San Antonio weatherization staff felt that financial limits on the amount of money that could be spent on repairs--at the time $100--made the program impractical for San Antonio's most problematic housing stock.

Under the limited MAUC program, 62 homes were weatherized but the city and the state parted ways over the geographic targetting of weatherization and the program was dropped.

While figures are not available for San Antonio alone, close to 46,000 low-income households were assisted under the Low-Income Energy Assistance Program in Bexar County during the winter of 1981. An additional 4800 households, with members 65 and older, received cooling assistance under the LIEAP during the summer months of 1981.[35] According to CPS, average monthly bills for low-income customers in 1980 were $37.48. In the winter, average highs among low-income households were $48.29 per month.[36]

Groups such as MAUC have taken up the energy cause of the poor and point out that these utility bills, particularly in winter months, are a serious problem in low-income neighborhoods. But neighborhood residents themselves are not that eager to see City funds used for energy. True, CDBG dollars could be allocated to energy as easily as to drainage, but in San Antonio, where floods are a constant threat, drainage takes first priority and as in other cities, politicians are looking for the most visible use of dollars at their discretion unless their constituents tell them otherwise.[37]

The city's agenda

Most San Antonians seem to be telling their elected officials that they want continued economic development and adequate municipal services at as low a cost as possible. During FY 80-81, CPS contributed $52.6 million in revenues to the city budget, a 21.4% increase over the previous year. This large increase is due to a jump in the sales of electricity because of the exceptionally high temperatures during the summer of 1980, especially June and July. The average number of cooling days from June - September, 1980 was a record 2541.[38] But even with this source of funds, San Antonio is caught in many of the same squeezes as other cities. City officials have embarked on a cost-cutting campaign of which energy efficiencies are an important part.[39] The city manager's office has set fuel goals for each city department, which are met primarily by reductions in fleet usage. The city is also converting as much of the municipal fleet as possible to propane. The city manager has set stringent budget targets for each department. Merit increases are tied to the extent to which department heads meet these goals. "The meeting of fuel goals is the number 1 priority," says Deputy Manager Fox. The city is also starting on a plan to retrofit older municipal buildings. It has completed improvements at the Market Square municipal office annex and is programming energy-related improvements in the Convention Center.

The city's own energy efforts have been partly designed to set a wider example for the community. An energy office was set up under the city manager to coordinate and develop various city energy programs, including retrofits, purchasing, ride sharing and land use activities. This year, in a reorganization, the program was moved to the planning office, a shift that was viewed by some as a downgrading of energy importance but which the Deputy City Manager maintains will give the program greater coordination powers and accountability. The energy office is investigating land use and planning issues, among others, and the city has received a grant from Argonne National Labs to evaluate city codes and provide incentives for energy efficient development. The planning director has set up an Energy Conserving Development Committee, composed of lawyers, developers and architects to examine regulations to see what inhibits and what encourages energy conscious development. The City has also received Department of Energy funds to develop a small business energy management program designed to provide resource materials and training seminars for small businesses.

Probably the most successful of the city-sponsored energy programs has been the employer-based ridesharing program which provides computerized matching by employer for carpooling. About 40% of Kelly Air Force base now carpools to work and several other large employers also participate in the program. San Antonio has recently received DOT moneys to develop a neighborhood-based ridesharing program that will concentrate on home to work trips.

Energy Alternatives

San Antonio is the site of a leading solar research center--Trinity University--and the city has a coterie of active solar architects and engineers. Trinity University received $1.1 million in federal funds and contributed $0.5 million of its own to retrofit the university's central heating and cooling and domestic hot water for the athletic center and 5 dormitories which house about 500 students. In its first year of operation the plant had a utility savings of about $60,000 although the university acknowledges that these are partly attributable to general conservation measures instituted by the university, as well as more efficient electric air conditioning. Rigorous performance data on the plant has not yet been gathered.[40] Trinity is also developing an experimental passive test facility to demonstrate a variety of innovative thermal systems for space cooling. Some local architects have designed solar and earth sheltered homes in the general region and the Northside Independent School District recently constructed a pool facility heated by solar energy. Both the city (for the airport) and the Army bases have also expressed interest in some solar applications. The San Antonio Housing Authority has received $260,000 under HUD's solar demonstration program to test various solar applications on its 27-building Victoria Court housing complex. The housing authority also installed a solar domestic hot water system on a new 65 unit project for the elderly in 1978, and retrofitted hot water heaters to solar on its existing Blanco projects. The housing authority estimates a 6-7 year payback on these projects but as much as a 19 year payback on the best of the Victoria Court tests.[41]

Overall, however, passive solar has not received the sort of market penetration that one might expect in a sunny climate such as San Antonio. Solar units remain expensive and cost on average $2500. Central Distributors, an energy equipment company, has found the market slow and has only sold about 250 units since it started marketing them a few years ago. The primary market has not been in the city at all but in outlying, more affluent areas. The city's one attempt to generate interest in solar in local neighborhoods met with more positive response. The energy office applied for a HUD innovative grant to provide 1000 "breadbox" hot water heaters to low-income families, free of cost. The grant was turned down, but in the city's informal market research for the program, they found that about 75% of the applicants (all recipients of LIEAP funds) contacted under the survey were interested in having the solar hot water heaters installed.[42]

There has been a similar lack of interest in heat pumps and heat transfer systems, which could be appealing in a heavily air-conditioning dependent environment such as San Antonio. CPS has tried to promote heat pumps and a few new subdivisions have included them in homes. "But overall, homebuilders have not been successful marketing heat pumps," says Jack Thornton of CPS. "And we haven't been able to convince volume homebuilders of their value yet. Consumers are not accustomed to this type of heating and find it difficult to adjust to constant air circulation during the heating cycle."

Conclusion

The lack of strong interest in solar and other alternative technologies is only one symptom of a general low level of concern over energy in San Antonio. While consumers complain about the cost, they are most concerned about the supply. Except for a few activist groups, they tend not to be very critical of CPS's participation in the South Texas Nuclear Project and they have taken the lead from the mayor in casting blame not on the utility, but on the railroads. While the many low-income families in San Antonio do have an energy problem, San Antonio, like many other cities, has chosen to attack the income part of the issue, rather than the energy part. "We are the tenth largest city in the nation, but we are not one of the wealthiest," notes Shirl Thomas.

"What we need here more than anything else is more jobs and better paying jobs." San Antonio has a high employment rate and a stable economic base because of the four military installations in the area and its great attraction as a tourist site. However, San Antonio lacks a strong industrial base that could provide higher wages than the low level service jobs which now dominate the economy. "If we are serious about upgrading life for all our citizens, we have to guarantee better jobs," says Shirl Thomas. "The Mayor makes the linkage. We need lower priced energy and, above all, we need an adequate supply of it." In San Antonio, it appears that citizens and policy makers have placed energy in the "macro" context of the overall area economy, rather than the "micro" context of the individual homeowner or small businessperson.

FOOTNOTES

[1] Preliminary Census counts place San Antonio 9th or 10th among the nation's cities. The ranking will be determined by final 1980 Census tabulations.

[2] Department of Planning, preliminary 1980 Census estimates.

[3] County and City data book, 1977. U.S. Department of Commerce, Bureau of the Census.

[4] City of San Antonio Department of Community Development, Community Development Block Grant Three Year Plan, as amended, February 1980: Housing Assistance Plan.

[5] County and City data book, op. cit. (based on 1969 figures).

[6] Housing Assistance Plan, op. cit.

[7] U.S. Department of Commerce, Bureau of the Census, Detailed Housing Characteristics, 1970 Census.

[8] HAP, op. cit.

[9] CDBG three year plan, op. cit.

[10] City Public Service, memo reply to OTA queries, May 18, 1981.

[11] Information supplied by CPS, based on data compiled by Pacific Gas and Electric Company.

[12] City Public Service. Average residential rates as of July 1981. Average gas rates as of September 1981, but gas rates change monthly depending on transport costs and other factors, as allowed by state regulations.

[12a] City Public Service, op. cit.

[12b] Detailed Housing Characteristics, 1970 Census, op. cit.

[12c] City Public Service, op. cit.

FOOTNOTES (continued)

[13] The material on City Public Service is based on CPS's memo reply to OTA, op. cit., as well as interviews with CPS staff, especially F. E. "Jack" Thornton, Superintendent, Consumer Affairs, Customer Services Department; Oran E. Park, Special Assistant for Research; and Richard V. Gonzalez, Superintendent Consumer Information, Customer Services Department. Other interviews included Glenn Biggs, Chairman, Board of Directors, City Public Service and Roger Ibarra, Supervisor, Public Utilities, City of San Antonio.

[14] City of San Antonio, Electric and Gas Systems, Revenue Improvement Bonds, New Series 1980, Official Statement.

[15] CPS letter to OTA, op. cit.

[16] Jacksonville Electric Authority, Jacksonville, Florida. Comparison of Residential Electric Rates for 60 cities. Provided by CPS in response to OTA queries.

[17] City Public Service, op. cit., see footnote 12.

[18] City Public Service letter to OTA, op. cit.

[19] Ibid.

[20] Ibid. The decision to generate power using western coal was based on a number of factors, according to the utility. These included the desire to diversify CPS fuel supplies and the availability of low-sulfur western coal that eliminated the need for scrubbers.

[21] Data provided by the Office of the Mayor.

[22] Interviews with CPS officials, op. cit.

[23] Telephone interview with Roger Ibarra, Supervisor, Public Utilities, City of San Antonio.

[24] CPS response to OTA, op. cit.

[25] Interviews with CPS officials as well as response to OTA letter, op. cit.

FOOTNOTES (continued)

[26] F. E. "Jack" Thornton, Superintendent, Consumer Affairs Division, CPS, CPS response to OTA, op. cit.

[27] Based on interviews with lenders and business people, including Glenn Biggs, Chairman, First National Bank, William R. Sinkin, CEO, Texas Bank; and Boone Powell, AIA.

[28] Ibid., as well as unpublished interview data from Real Estate Research Corporation study for this OTA project.

[29] Housing Assistance Plan, 1980, op. cit.

[30] Ibid.

[31] Ibid.

[32] The material on SADA is based on an interview and data supplied by Winnie Doria, Housing Resources Manager, San Antonio Development Agency.

[33] Ibid.

[34] Details on the weatherization program are based on interviews with John A. Geistweidt,Director, Economic Opportunity Division, Texas Department of Community Affairs; Ruben Garcia, Technical Assistance Specialist, Economic Opportunity Division, Texas Department of Community Affairs; and Kevin C. Moriarty, Assistant Director, Department of Human Resources and Services, San Antonio.

[35] Texas Department of Human Resources.

[36] CPS letter to OTA, op. cit.

[37] CDBG Three Year Plan, 1980, op. cit.

[38] CPS letter to OTA, op. cit.

[39] The description of the city's program is based on interviews with Lou Fox, Deputy City Manager and Mary Flurry, Energy Management Coordinator, Department of Planning, as well as an unpublished memo from Mary E. Flurry to Roland A. Lozano, Director, Department of Planning, that details the status of city-sponsored energy activities.

FOOTNOTES (continued)

[40] Based on an interview with Earl S. Doderer, Assistant Professor-Civil Engineer, Department of Engineering Science, Trinity University; Gene Clark and C. H. Treat, Revised Proceedings of the Department of Energy's Solar Update, "Operating Experience: The Trinity University Solar Heating and Cooling Project".

[41] Based on an interview with Collas D. Smelser, Modernization Officer, San Antonio Housing Authority.

[42] Based on material provided by Office of Energy Management, City of San Antonio.

Interviews: San Antonio

City Officials

Lila Cockrell, Mayor, San Antonio

*Lou Fox, Deputy City Manager

Shirl Thomas, Special Assistant, Office of the Mayor

*Roland Lozano, Director, Department of Planning

*Mary Flurry, Energy Management Coordinator, Department of Planning

Gary C. Gilbert, Office of Energy Management, Department of Planning

Rhea Korsh, Deputy Director, Department of Community Development

Rose Valdez, Former Energy Coordinator, City of San Antonio

Roger Ibarra, Supervisor, Public Utilities

Winnie Doria, Housing Resources Manager, San Antonio Development Agency

Kevin C. Moriarty, Assistant Director, Department of Human Resources and Services

Edward O. Greff, Director of Development, San Antonio Housing Authority

Collas D. Smelser, Modernization Officer, San Antonio Housing Authority

State and Regional Officials

Larry Morgan, Program Coordinator, Conservation Division, Texas Energy and Natural Resources Advisory Council

John A. Geistweidt, Director, Economic Opportunity Division, Texas Department of Community Affairs

Ruben Garcia, Technical Assistance Specialist, Economic Opportunity Division, Texas Department of Community Affairs

Charley Jennings, Contract Manager, Home Energy Assistance Program, Texas Department of Community Affairs

David Frost, Alamo Area Council of Governments

Utilities and other energy suppliers

*F.E. "Jack" Thornton, Superintendent, Consumer Affairs, Customer Services Department, City Public Service

Oran E. Park, Special Assistant for Research, City Public Service

Richard V. Gonzalez, Superintendent, Consumer Information, Customer Services Department, City Public Service

Business and Financial

Glenn Biggs, Chairman, First National Bank; Chairman, Board of Directors, City Public Service

*William R. Sinkin, Chairman of the Board, Chief Executive Officer, Texas Bank

Joe G. Reyes, Staff Manager, Greater San Antonio Chamber of Commerce

Boone Powell, AIA, Principal, Ford Powell & Carson, Architects and Planners

William M. Hays, Jr., Partner, The Marmon Mok Partnership, Architects, Engineers, Planners

Barbara Banker, President, Williams Insulation

*Howard G. Rogers, Energy Consultant

Public Interest

*Mike Garcia, Mexican-American Unity Council

Beatrice Cortez, Community Organization for Public Service (COPS)

Janet Ahmad, Homeowners for Better Building

Louise L. Cantwell, San Antonio Conservation Society

Lanny Sinkin, Citizen Activist

Academic

Earl S. Doderer, Assistant Professor-Civil Engineer, Department of Engineering Science, Trinity University

*Reviewers

TAMPA

The main forces for energy conservation in Tampa are the Tampa Electric Company (TECO) and the city government. While residential utility rates have increased by 350% since 1970[1] and 9% of the population requires federal housing assistance,[2] there has not been strong consumer pressure for conservation in Tampa. Rather, the impetus has been institutional. In TECO's case, it stems from an aggressive state Public Service Commission. In the city's case, it emanates from a managerially-oriented administration that sees an opportunity to cut energy costs and relieve some fiscal pressure on the city.

The most important civic issues in Tampa are matters of growth and development in the city and its environs. Between 1970 and 1980, the population of the city dropped from 277,753 to 268,709.[3] This is in contrast to surrounding Hillsborough County which experienced a 30% increase in population during the same period.[4] At the same time, even though Tampa has lost population, it has recently experienced extensive downtown office and commercial development. In 1980 alone, there was about $165 million of new development in the city, including a 540-room Hyatt Regency Hotel and 1.5 million square feet of office space.[5] The city is also the location of the seventh largest port in the United States and an airport that in 1979 served more than 8 million passengers.[6]

This growth picture has implications for energy conservation and the role it plays in Tampa. The intensive development in the Tampa area has put great stress on natural systems and infrastructure. Tampa's community development block grant application cites drainage, an obsolete water distribution system, poor water quality, and deteriorating sewer transmission and collection lines as important citywide community development needs.[7] Public interest groups in the city and county have focused on these and other environmental issues related to growth, rather than on housing quality and energy.

While growth will ultimately add to the city's tax revenues, it is also putting a strain on municipal services. The mayor, Bob Martinez, is acutely conscious of the need for fiscal belt tightening. The city is faced with the need to provide additional services as a result of its downtown growth, as well as the necessity to upgrade declining facilities in older parts of the city. Furthermore, the city has recently recovered from a substantial shortfall which could have been as high as $18.2 million for fiscal 1981 without tough cost cutting steps.[8] For the future, the mayor has recommended strict controls on energy consumption as one measure to keep a lid on the budget. "In terms of institutional costs, it is an issue," he says of energy. And he has passed that message down the line in his government.

Growth is also an issue for TECO, the area's main utility. The state's consumer-oriented Public Service Commission adopted regulations in September 1980 that require utilities to balance conservation against capital expansion. TECO is rapidly adding more customers in the Tampa region but is trying to reduce overall energy demand at the same time to meet the state requirements. The very source of customer growth -- new residential construction -- is also the place where TECO feels conservation activities are most promising.

From the citizen's point of view, energy costs are not a pressing issue. Tampa has a benign climate whose January mean temperature is around 60 degrees and whose July mean temperature is in the low 80s.[9] The residential electric rate as of November 1979 was 5.8¢ per kwh,[10] which could be burdensome in units that use air conditioning heavily. But, according to 1970 census figures, 45% of the housing units in the city had no such equipment.[11] Tampa has a large elderly population -- 12.4% -- and its percentage of households below 125% of the poverty line is close to 21%,[12] but energy requirements for both groups are not as pressing as they are in cities with harsher climatic conditions. About a quarter of the city's housing -- much of it wood frame bungalows -- was built before World War II and close to 15% of the city's housing stock has been classified as substandard by city officials.[13] The combination of environmental factors and housing conditions weigh more heavily on the minds of low-income residents than do energy matters.

TECO: Selling Conservation[14]

While TECO has had an interest in conservation both as a public service and for economic reasons, the utility's strong push for conservation largely stems from rulemaking by the state's Public Service Commission.

In September 1980, the PSC adopted stringent rules designed both to reduce the growth rates of electric consumption (and especially weather sensitive peak demand), as well as the use of oil as a generating fuel. Under the rules, PSC will review all proposed rate increases against the utility's conservation record and measure conservation as an alternative to new power plant construction as a means of "increasing" capacity. The PSC will set demand and energy goals for utilities such as TECO and mete out rewards and penalties in the event that utilities meet the goals. Utilities that meet or exceed the PSC goals will be allowed a higher return on their equity. For those utilities who fail to meet the goals, a lower return will be authorized.[15]

Several factors have entered into the PSC's interest in fostering conservation. One is the longitudinal nature of the state's powerline configuration, which makes interconnections on a north/south basis difficult. This can result in the need for a higher reserve margin or more capacity. Moreover, the state is increasingly subject to weather-sensitive peak demand, particularly in the winter months. In its submission to the PSC, TECO observes: "Tampa Electric Company expects to be a strong winter peaking company in the future. The gap in winter and summer peaks will widen unless programs are instituted to reduce the expected difference."[16]

Perhaps most important is the state's heavy electric consumption and the extensive use of oil and gas to generate electricity. The overall per capita electric use in Florida now exceeds the national average and the rate of increase in electric use has been almost twice that of the nation. More importantly, within the residential sector, electric usage exceeds the national average by over 40%. Whereas overall in the United States residential energy use only accounts for 11% of total energy consumption, in Florida it amounts to 23%.[17] These facts are of even more alarming concern to state energy planners because of the overwhelming use of oil and gas in Florida to generate electricity. According to state energy figures, 58.5% of the state's electricity is generated by oil.[18]

In TECO's case, electricity is produced through a mix of fuels of which oil represents only 23%. And TECO is moving to convert more of its electric generation away from oil to coal. The utility has received permission to build a $450 million coal-powered power plant. The PSC is also allowing TECO to convert four units of another generating plant to low-sulfur coal.[19]

For utilities, such as TECO, "conservation now becomes an alternative resource," in the words of G. J. Kordecki, Assistant Director, Conservation and Load Management for TECO.

Under the PSC rules, energy is allowed to grow at 75% of TECO's customer growth rate and demand at 72.25% of that. The specific 1980-1985 goals under the PSC rules are threefold:[20]

- to reduce the growth rate so that the total 1985 KW demand does not exceed that of 1984 by 2.21%;
- to reduce the growth rate in total KWH consumption in 1985 so that it does not exceed that of 1984 by more than 2.6%; and
- to reduce the use of oil as generating fuel by 25% by 1990.

TECO's share of demand and energy goals is a 2.1% 1984-85 increase in winter demand and a computed allowed growth rate for energy of 2.47%. With the conservation programs proposed by the utility, the demand growth rate is estimated at 2.29%.[21]

To meet the state goals over the next 5 years, TECO has proposed a 7-point $49 million conservation strategy, heavily oriented toward the new residential market. The most important elements of the programs are the following:

- electric heat pumps. About 61% of all TECO's customers use electric heat and about 90% of the new installations involve electric resistance heat. Altogether, these contribute approximately 25% of TECO's winter peak. TECO hopes to install electric heat pumps in 60% of the new homes that opt for electric heat and to place heat pumps in existing housing at the rate of 2000 a year over the next five years. The utility projects as much as a 60% reduction in energy usage in heating overall in those homes with electric heat pumps. The utility plans to offer incentives to subsidize first cost differentials between heat pumps and air conditioning and electric furnace and duct heaters. In the case of new construction, the incentives will be offered to builders; for existing units it will be offered to homeowners. TECO will also offer incentive payments to mechanical contractors to help push the program and ensure proper installation.

- storage water heating. Virtually all new units and 93% of existing units use electric water heating. About 195 MW in winter and 78 MW in summer are found to be on peak. TECO proposes larger, high-efficiency water heaters with an outside control to regulate running hours and remove some demand to off-peak periods. The utility hopes to provide these more efficient, but also more expensive, water heaters to a majority of new homes and to about .5% of existing units a year over the 5 year period. The utility will offer incentives to offset the increased cost of the larger heater to builders and homeowners and allow a monthly rate discount to any residential customer who allows the water heater control.

- energy audits. TECO will offer audits under the RCS program for residential customers and will expand its audits to large commercial/industrial customers. TECO has set a goal of 1800-2000 audits a year, but in the two years the company has already been running audit programs, Kordecki says, "there has been very little market interest." That impression is also shared by Glyn Hazelden, Superintendent of Operations for Peoples Gas System, whose audit program has been subcontracted to TECO. "Customer response to energy audits is less than 1/2 of 1%," says Hazelden. Audits are a much less important part of TECO's overall conservation strategy than persuading homebuilders to put electric heat pumps in new houses.

- direct control load management. TECO acknowledges that this approach could be promising but warns that there are both technological and customer acceptance issues that must be worked through first. So the utility is starting slowly, on an experimental basis, with voluntary participation. Direct load control will be in the hands of the utility and rate incentives will be offered to customers to offset any inconvenience. If the program seems feasible, TECO expects to have about 25,000 customers under direct control load management by 1990.

In addition to these four programs, the TECO plan also includes proposals for co-generation, commercial-industrial interruptible service and incentives for those builders who meet energy efficient code standards.

The Residential Market

All of these programs are, for the most part, directed at the residential market. TECO fully expects growth among its commercial and industrial customers, but sees the greatest potential for conservation among new residential customers. According to the utility, growth in new residential customers increased by 4.8% between 1978-79[23] and, while some slowing is expected in the near future, the company sees continued expansion of its residential sector. Furthermore, TECO's new residential customers have energy consumption levels about 20-30% higher than existing customers.[24] "There has been a prevalent feeling that the existing market is where it's at," Kordecki observes, "but we don't feel that way. The new residential market is the easiest place to make the most conservation gains."

However, despite its aggressive efforts to reach the new residential market, TECO's submission to the PSC includes this sobering comment: "Although Tampa Electric is committed to enthusiastically pursue its conservation programs, it should be reiterated that the electric utility customers, and not the utility serving them, hold the real key to the success or failure of energy conservation programs."[25] How well have TECO's customers responded?

TECO has been offering audits to its customers since 1978. These have been promoted through bill-stuffers and the media. In addition, in 1979 the company sent a special mailing to 42,000 of its customers with higher than average home energy usage. This was about 13% of the company's total 313,000 customers.[26]

About 10,000 TECO customers have requested audits since the utility began offering them, and the vast majority of these have been requested in the last year.[27] According to a study carried out by Suncoast Opinion Surveys of a sample of these audited customers, 70% of the customers had installed at least one measure and 50% two or more measures. The majority of the measures added were low cost, such as duct taping and weatherstripping.[28]

Residents of existing housing in Tampa have not shown a strong interest in investing in energy conservation, despite what is apparently a strong need for energy-related improvements. City housing officials sense a high percentage of homes with inadequate insulation and infiltration barriers,[28] although no actual surveys of energy conditions in Tampa housing stock have been made. At the same time, lenders such as Tom Giddens, senior vice-president of Freedom Savings, say there is very little interest among homeowners in borrowing money for energy improvements. Many local residents are coping with rising energy costs by simple low-cost methods, such as attic fans, or they are using air conditioning less.

More promising have been efforts to reach the new housing market, which is where TECO has put the emphasis in its program. There is considerable interest by local homebuilders in electric heat pumps. TECO has exceeded the goals it set in its PSC proposal under the heat pump program even though the utility has limited rebates under the program only to centrally air-conditioned gas heated housing.[29]

Local homebuilders have also shown interest in passive solar design, including window film and overhangs. A 1981 amendment to the state Constitution would allow a property tax exemption for up to ten years on new solar and other "renewable energy source devices" bought for homes and businesses. Local environmental groups have also been pressing for regulations to require solar hot water heating on all new homes in the Tampa Bay area, although there is little political support for such a measure.

TECO has also pushed incentives to motivate builders to improve the overall energy efficiency of their units. The utility gives a Home

Energy Efficiency Award to homebuilders whose units meet TECO standards. About 65 homebuilders and 5,000 homes qualified for the award between 1976-1979.[30] This is about 18% of the 28,267 new housing units built in Hillsborough County during this period.[31]

One of the biggest spurs to energy improvements in the new residential market has been the Florida Energy Code,[32] especially the 1980 amendments which established the Florida Model Energy Efficiency Code for building construction. The code covers all new construction and any building in which improvements amount to more than 30% of the total value of the structure also come under the code, so much rehabilitation in the city is covered. In addition, amendments to the state building code require that piping in structures covered by the law allow both future connection of solar units and waste heat recovery equipment.

The chief feature of the code is the Energy Performance Index (EPI), which is a measure of the building's energy efficiency. To meet code requirements, a building must achieve an EPI of 100 points or less. The lower the EPI, the more efficient the building. The technical basis for the Florida energy code is ASHRAE 90-75, and the HUD Minimum Property Standards,[33] but the state code has been modified to make it applicable to warm climates. For example, the code places a premium on ceiling insulation since in Florida, with its sunny climate, attic temperatures can reach 140 degress or higher. Water source heat pumps are given bonus points under the code because they take advantage of the relatively warm ground water temperatures found in the state. Special attention under the code is paid to air conditioning and hot water heaters, since both are a major user of building energy in Florida.

The code is meant for consumers as well as builders. It must be given to prospective buyers of any building or condominium, a requirement that may lead to greater competition among housing producers for more energy efficient buildings. It can also easily be calculated by hand from the plans of a building. No computer or extraordinary technical expertise is needed to calculate a house's EPI.

Commercial Buildings

TECO has assigned lower priority to encouraging conservation among commercial and institutional users because their consumption patterns contribute less dramtically to TECO's peak problems. Nevertheless, TECO has participated in a model program set up by the Greater Tampa Chamber of Commerce, in conjunction with the Tampa Chapter of the Florida Engineering Society. The Chamber has put together the HEAT program (HEAT stands for Hillsborough Energy Audit Team) to offer audits and detailed energy conservation recommendations to privately owned companies whose utility bills are between \$1,000-\$17,000 a month.[34] Under the program, a Corps of Volunteers, composed of Chamber residents, has contacted building owners and encouraged them to have an audit. Then a consulting engineer carries out a comprehensive audit of the building and develops a program in the form of a detailed written report for the building owner to reduce energy consumption. The audit costs \$150 for Chamber members and \$175 for others. In 1979, the first year of the program, 60 firms signed up for the audit -- about 34% of those initially contacted. This relatively high participation rate is largely because the program is a businessman-to-businessman operation. "Building owners dislike seeing government come in, but they will accept someone from business," observes the coordinator of the program.

The program was reasonably successful in reaching large building owners, and its designers felt a need to target audits to smaller commercial owners. The Chamber's HEAT program has now been phased out, and TECO has taken over the marketing of commercial audits, particularly to these smaller customers.

As in many other areas of energy conservation, you can lead a horse to water but you can't make him drink. While a substantial number of firms opted for the audit, the Chamber is less sanguine that they took the recommended actions to cut energy usage. "Follow-up has been our big problem with this program," observes Hal Cusick of the Chamber. The HEAT team has presented the data to each participating owner in terms of implementation cost and potential annual savings and some of these paybacks are quite dramatic. But implementation of these energy saving measures has not been as extensive as the program organizers had hoped. "Building owners are aware of possible savings," says a banker who heads the Chamber's energy committee. "But they have to ask: can the cost of financing be equated with energy savings?"

Nevertheless, office owners have made a wide range of improvements to existing buildings. These include replacing oversized air conditioners, turning off hot water heaters, computerized energy management, reducing air conditioning hours, lighting improvements, and controls to relate chiller temperatures to outside air. For the most part, these improvements have been made from firms' own capital resources, without seeking outside financing. On the other hand, as in other cities, competitive pressure from new office buildings is making owners of existing commercial space much more conscious of energy conservation as a marketing point. New buildings are affected by the state energy code and thus include energy saving features by necessity. Those seeking space in existing structures, said several building owners, were paying attention to energy matters in the decision as to where they leased space.

Government: Setting an Energy Conservation Example

The city's interest in energy conservation stems largely from the serious fiscal problems inherited by the current Mayor, Bob Martinez, when he came into office in 1979.

One of the mayor's first tasks was to deal with a projected $18.5 million budget shortfall. He cut this in half by borrowing $9.6 million from the Utility Tax Funds for FY81 non-capital, recurring operating expenditures, and the rest he made up by stringent budgetary belt tightening. Most dramatically, he imposed a limited personnel hiring freeze, laid off about 30 employees, and opted not to hire CETA workers for permanent city slots.[35]

The city's budget problems were partially attributable to inflation and a declining tax base. Furthermore, Florida municipalities have a cap on ad valorem tax increases of ten mills per year, unless a financial emergency is declared. This would not have been a problem if property in Tampa was reassessed on a more frequent basis. However, this was not the case in the city and the true market value of much of Tampa's property was not reflected in the tax rolls.[36]

In this context, escalating energy costs were a contributing factor to Tampa's budget problems but by no means the major cause of them. The significance of energy increases is more that energy has offered the mayor a ready means of controlling some important municipal costs.

For example, since 1978, street lighting bills in the city have increased by more than $422,000, or 37.3% a year. The primary cause of this has been the fuel adjustment charge levied by TECO on the city. Tampa is now using Community Development Block Grant funds to convert street lights to less expensive high pressure sodium vapor lights in one neighborhood, and the entire street lighting network of the city is expected to be similarly converted by 1992. This overhaul will be undertaken by TECO as part of a PSC ruling that requires all new street lights within the TECO service area to be high pressure sodium vapor. Ultimately, the cost of street lighting to the city will go down; initially, however, the cost of conversion will be reflected in the city's bill.[37]

Most far-reaching, in terms of municipal energy management, has been the mayor's institution of "target budgets" and tighter management controls. Among other things, the mayor reduced the number of city owned and operated vehicles by causing each department to amortize its fleet out of its own budget allotment. The city reduced the use of vehicle fuel by 26% by converting about 50% of the nonsafety fleet to subcompacts and LP gas-powered cars and trucks, as well as thorugh low cost methods, such as rerouting sanitation trucks.[37]

In terms of energy, it is clear that transportation-related measures, such as fleet reduction and more fuel-efficient cars, have taken higher priority. Major capital improvements on buildings are of less importance in the mayor's cost-cutting program. The city is carrying out energy audits on major municipal buildings and implementing a Building Operations Service System (BOSS) computerized energy management system in the main library.[39] Through his "service level management" approach, which forces department heads to manage within a lower budget than last year, it can be expected that energy efficiencies will probably be realized mostly through behavioral changes, such as turning down (or up) thermostats, shutting off lights and using machines with greater energy sensitivity.

The most extensive work in retrofitting public buildings has been done by two non-city agencies -- the Housing Authority of Tampa and the Hillsborough County Board of Education. The Housing Authority of Tampa has 5400 units, which makes it the second largest housing authority in the state and the "52nd largest city" in Florida.[40] The Tampa Housing Authority was the first in the nation to introduce solar hot water heating some 30 years ago, the first Housing Authority in the nation to do so. These solar units have not been kept up over the years but the current executive director, Alton M. White, thinks an old idea may be worth a try once again. With $30,000 from HUD, the housing authority is experimenting with solar hot water heating panels. The demonstration is being monitored by the University of South Florida and the housing authority expects a 50% saving in hot water heating costs.

The Housing Authority is also using a large portion of the modernization money it has received from HUD for energy conservation improvements. In one case, the Housing Authority is reventing the entire building, and in another adding insulation. The housing authority is also upgrading gas burners to a higher efficiency and is considering heat pumps in some cases. A new project of 300 units is being built with a central heating system that can convert easily to solar space and hot water heating should it be economically beneficial. "Energy is a very high priority with us," says White. The Housing Authority finds that the cost of utilities for its operations comes to about $2.6 million, or close to $46 a unit.[41]

The Hillsborough County School Board has used bond monies for capital improvements and established an incentive program for principals to reduce energy consumption.[42] The school board has a full-time energy "manager," Stanley Dormal, who is now phasing in a central energy management system, which will eventually serve 16 schools in the system. These schools consume about 40% of the electric budget for the entire system. Many of them are newer schools with less energy-efficient electric strip heat. The "BOSS system" is expected to result in a gross saving for the high school, in which it is already installed, of about $36,000 for the first year. BOSS controls air conditioning and heat strips but not lights. Lighting is about 25% of the total electric costs of the school district. Dormal has also used federal and state funding to install a solar unit on one school, and to place a heat recovery/heat exchanger unit on two elementary schools.

One of the reasons Dormal places high hopes for the BOSS system is that it gets at one of the chronic energy problems of many school systems -- poor energy habits. "The biggest abuse and the biggest savings," he notes, "is the failure to turn off systems at the end of the school day. The biggest payoff is in using environmental systems correctly." Even before "BOSS," Dormal instituted an incentive program in which principals get a rebate equal to a percentage of the energy savings in their school.

As a result of the program, $172,000 was saved last year and $73,000 was returned to individual schools for use in the educational program.

Energy Conservation and Low-income Consumers

Beyond the energy activities it has promoted to conserve energy in its own operations, the city (and the county) also have some responsibility to address energy concerns of the area's low-income population. Most of the residents of homes in older areas of the city, where the low-income population predominantly lives, are not customers of TECO. While the major homebuilding boom of the 50s and 60s produced units that rely primarily on electricity, the majority of older homes in Tampa -- 70,378, out of a total occupied units of 120,686 -- use kerosene or oil. A smaller number -- 10,282 -- use gas, a figure which includes most public housing units and MacDill military base.[43] These oil customers have been hit by a double blow: rapid price increases and fuel shortages, particularly for those older homes which use kerosene. One of the major oil suppliers announced in the fall of 1980 that it would discontinue delivery of kerosene to Florida because there was a higher return on this grade of oil as jet fuel. The tenuousness of the kerosene supply has driven most of the smaller dealers out of business in Tampa and today two large dealers dominate what is left of the market.[44] County officials estimate a 2.5 million gallon shortfall on Kerosene for 1981. "The problem will get much worse over the next 5 years," says one county official.[45]

Increasing energy costs have been particularly problematic for the elderly who live in older homes and can afford neither to upgrade to a less expensive heating source or pay the higher costs of heat. According to the city's Housing Assistance Plan, there were slightly over 22,000 households in need of some form of housing assistance in 1979, 48% of whom were elderly or handicapped.[46]

Escalating energy costs have been reflected in unpaid bills and shut-offs. One oil distributor in Tampa estimates that his accounts receivable are up 60% over last year.[47] People's Gas, which also serves many low-income households, particularly in public housing, also noticed a rise in arrearage.[48] County and city officials who deal with low-income assistance programs generally give high marks to all the energy suppliers for a generous and humane shut-off policy. "There isn't much problem with shut-offs," says Chris Maurici of the County Community Action Agency. "We have good relations with the energy companies. If TECO knows it's an ECAP case, they won't shut it off."

Unfortunately those programs, such as ECAP, which are designed to provide assistance for utility bill payments, have been poorly managed in Tampa. A Peoples Gas official said it was not uncommon to wait for 8 weeks from the state for ECAP payments and county welfare officials note that some dealers were still owed money 90 days after service was offered.[49] "Some dealers just refuse to participate in the program anymore," said one county official. Lengthy planning procedures and bureaucratic snafus at the state level and abrupt changes in payment amounts are blamed by almost everyone in Tampa for the ECAP problems.[50] "ECAP was a nightmare," says Chris Maurici of the Community Action Agency, which administers the program for the county. In Hillsborough County, about $250,000 was distributed through ECAP to 1360 recipients, most of whom reside in Tampa.[51] This barely touches the close to 22,000 total low-income residents in the city.

The current state program will provide direct cash assistance to all eligible welfare recipients rather than to the vendor. Unlike ECAP, which was coordinated with weatherization activities, the new assistance programs will be distributed through district welfare offices without close ties to other energy assistance programs.[52]

Hillsborough County's weatherization program, also run out of Chris Maurici's office, has been in operation since 1976 and 60% of its activity is in the city of Tampa. The program has employed as many as 20 CETA workers. The program has emphasized "stopping the leakage" -- particularly through storm doors, storm windows and caulking. It has also been closely coordinated with both ECAP and city rehabilitation programs. The weatherization program is good as far as it has gone, says Maurici, but, as in most other cities, there is an enormous unmet need. Between 1977-80, 400 homes were weatherized under the program.[53] City housing officials estimate that there are 13,082 substandard homes in Tampa alone.[54] Not only could Maurici's program use more money, it has also been hampered by federally-imposed limitations on supervisory personnel, a complaint echoed in many other cities as well.

Nor is the slack being taken up by city-run rehabilitation programs. Tamps housing officials expect that the majority of housing assistance needs will be met through existing federal subsidy programs, such as Section 8, Section 202 (elderly), and public housing. Tampa's three year housing assistance plan sets a total goal of only 141 rehab units.[55] The Tampa rehabilitation program emphasizes a deep "financing substantial rehab approach" in which the average loan is $17,000 and runs for 20 to 30 years. "We are very conscious of the remaining economic life of the unit," says one city official, and as a result, some energy improvements are made. The basic energy package for housing under the program includes replacing wood sashes, insulation, skirting, roof improvements, and conversion when feasible to electric resistance heat.[56] This is a substantial package of improvements but, given the level of Tampa's investment per unit, not very many homes are touched. Between 1977-1980, only 535 homes were rehabilitated in the city, or 4% of the estimated substandard units.[57]

"There have never been and there still are not enough funds to deal with the basic housing needs of the city," says Sharon Russell, a rehab planner for the city. "We deal with basic energy needs as part of rehab but we find that in low-income neighborhoods there are much more basic needs than energy." As in other cities, Tampa does put a great deal of emphasis on code enforcement but by and large has not extended the definition of code violation to include energy problems.

Conclusion

Energy is not, in and of itself, a high priority city or country issue. In the voters' minds, growth -- more of it and better management of it -- economic development, improved public transportation, and environmental issues, such as flood control and storm water management are the sources of political capital. Tampa lacks a strong constituency for energy conservation, not only from voters, but also from public interest groups (who are more concerned with environmental matters), and from neighborhoods, which are poorly organized. By and large, the city's interest in energy has been quite limited to its own budget problems. The greatest interest in energy conservation at the moment stems from TECO and it is looking for support to the future -- buyers of new homes -- not the present energy consumer.

FOOTNOTES

[1] Tampa Electric Company, correspondence between G. J. Kordecki, Assistant Director, Conservation and Load Management, and OTA, March 27, 1981.

[2] Housing Assistance Plan, May 1979. Fifth Entitlement Application, Three Year Plan (Entitlements V, VI, VII) Housing and Community Development Act of 1974, Title I, submitted by City of Tampa, Revenue and Finance, Bureau of City Planning. "Households in need of federal assistance" are defined as those having an income below 80% of the SMSA median and suffering from at least one of the following indicators of housing deprivation: substandard condition, overcrowded quarters (more than 1.25 persons per room), or paying in excess of 25% of income for rent or other housing expenses.

[3] Hillsborough County Planning Commission; 1970 Census; 1980 Census (preliminary estimates).

[4] Ibid.

[5] Downtown Development Authority, 1980 Annual Report, City of Tampa.

[6] Tampa Chamber of Commerce, Tampa Facts, 1980. Figures are based on 1979 airline passenger and port tonnage figures.

[7] Bureau of City Planning, Fifth Entitlement Application, op.cit., pp. 28-39.

[8] Department of Finance and Revenue, Annual Budget, Fiscal Year October 1, 1980 - September 30, 1981 (City of Tampa, August 1980) pp. 26-35.

[9] County and City Data Book, 1977; U.S. Department of Commerce, Bureau of the Census.

[10] Tampa Electric Company, average rate as of November 1979.

[11] 1970 Census, Detailed Housing Characteristics.

[12] County and City data book, op. cit.

FOOTNOTES (continued)

[13] Housing Assistance Plan, op. cit.

[14] Much of the material in this section is drawn from on-site and telephone interviews with G. J. Kordecki, Assistant Director for Conservation and Load Management of Tampa Electric Company.

[15] Florida Public Service Commission, Docket No. 800522-EG, Order No. 9552, adoption of Rules 25-17.01 through 25-17.06 F.A.C., establishing statewide energy conservation goals as required by the Florida Energy Efficiency and Conservation Act, September 17, 1980.

[16] Tampa Electric Company, Petition of Tampa Electric Company before the Florida Public Service Commission for approval of its conservation program, November 3, 1980.

[17] Florida Department of Administration, Division of State Planning, The Florida State Comprehensive Plan: Energy Element, October 1977, pp. 11-15.

[18] Florida State University, Patterns of Energy Consumption in Florida: 1976, prepared for the State Energy Office, January 1979 by the Energy Patterns Study Group, College of Business, Florida State University, p. 8.

[19] TECO PSC submission, op. cit.

[20] PSC rule op. cit.; TECO submission, op. cit.

[21] TECO submission, op. cit.

[22] Ibid.

[23] Tampa Electric Company, Annual Report, 1979.

[24] TECO, PSC submission, op. cit.

[25] Ibid.

[26] TECO, Annual Report, op. cit.

[27] G. J. Kordecki, correspondence with OTA, op. cit.

FOOTNOTES (continued)

[28] G. J. Kordecki, *Audited Customers: Conservation Measures Installed*, *unpublished report on Suncoast Opinion Surveys study, October 1979.*

[29] Kordecki interview.

[30] TECO, *Annual Report*, *op. cit*.

[31] Building Departments Hillsborough County and Cities of Tampa, Temple Terrace and Plant City, as published by Research Department, Greater Tampa Chamber of Commerce.

[32] The discussion of the Florida State energy code is based on interviews and written materials provided by: Ron Rotella, Director, Building Inspection, City of Tampa; Renee Faass, Energy Conservation Coordinator, Department of Public Works, City of Tampa; and William Kennedy, Governor's Energy Office.

[33] National Institute of Building Sciences, *A Summary of State Energy Codes*, Washington, DC 1979.

[34] The discussion of the HEAT program is based on interviews with Chamber of Commerce staff and members involved in the program; G. J. Kordecki of TECO, and materials provided by the Chamber on the program.

[35] The material on municipal energy saving measures is based on interviews with Tampa city officials, especially Mayor Bob Martinez and Richard Garrity, who was the energy coordinator for the city at the time of the site visit. This material was also based on detailed responses to OTA queries by Renee Faass, the city's current energy coordinator, in a letter dated April 16, 1981. Further material is drawn from The City of Tampa Annual Budget, *op. cit*.

[36] Faass letter and 1981 Annual Budget, *op. cit*.

[37] Faass letter, *op. cit*.

[38] Mayor Martinez interview; annual budget, *op. cit*.

[39] Minutes of Energy Committee meeting, City of Tampa, December 12, 1979; Faass letter, *op. cit*.

[40] The material on the Tampa Housing Authority is drawn from the interview with Alton White, Executive Director of the Housing Authority as well as the *Annual Report* of the Tampa Housing Authority, fiscal year ending March 31, 1980.

FOOTNOTES (continued)

[41] Tampa Housing Authority, Annual Report, op. cit.

[42] The material on the Board of Education is drawn from the interview with Stanley J. Dormal, Energy Coordinator of the Hillsborough County Board of Education.

[43] 1970 Census, Detailed Housing characteristics; interview with Glynn Hazelden, People's Gas Company.

[44] Interview with J. H. Williams, Jr., fuel oil dealer.

[45] Interview with Don Harwig, Hillsborough County Energy Coordinator.

[46] Housing Assistance Plan, op. cit., based on 1970 Census, updated by R. L. Polk and Company's 1974-75 Profiles of Change, and State of Florida, Department of Health and Rehabilitation Services, SSI Computer Files, January 1978.

[47] Williams interview, op. cit.

[48] Hazelden interview, op. cit.

[49] Hazelden and Harwig interviews, op. cit.

[50] Harwig interview op. cit.; interview with Chris Maurici, Community Action Agency of Hillsborough County.

[51] Maurici interview, op. cit.; City of Tampa, Energy Conservation Coordinator.

[52] Interview with Joan Cappolino, State Social and Economic Services Department.

[53] Community Action Agency of Hillsborough County; covers period June 1976 - March 1981. Yearly totals are the following: 1976-1978: 191; 1979: 72; 1980: 84; 1981: 53. Totals are for Hillsborough County, not just City of Tampa.

[54] Housing Assistance Plan, op. cit.

[55] Ibid.

FOOTNOTES (continued)

[56] Interview with Sharon Russell and Ron Rotella, Division of Project Planning and Grants Administration; and Ron Rotella, Director, Building Inspection.

[57] City of Tampa Energy Conservation Coordinator; covers period 1975 - 1980 and includes only units rehabilitated under CDBG program.

Interviews: Tampa

City officials

Bob Martinez, Mayor, City of Tampa

Joan T. Smith, Director of Project Planning and Grants Administration

Sharon Russell, Division of Project Planning and Grants Administration

*Richard D. Garrity, Department of Public Works

Alton White, Executive Director, Tampa Housing Authority

*Ron Rotella, Director of Housing Inspections

*Renee T. Faass, Energy Conservation Coordinator

County officials

Donald H. Harwig, Director, Facilities Maintenance, Hillsborough County

William B. Shirley, Energy Conservation Engineer

Sam Uccello, Director of Consumer Affairs

Dick Quinette, Consumer Investigator

Judy Geiger, Energy Extension Service

David Lee, Environmental Engineer I

Stanley Dormal, Energy Coordinator, Hillsborough County Board of Education

Chris Maurici, Weatherization Coordinator, Hillsborough County Community Action Agency

State officials

Joan M. Cappolino, District Program Specialist, Social and Economic Services

Vicki Tschinkel, Assistant Secretary, Department of Environmental Regulation

State officials (continued)

William Kennedy, Governor's Energy Office

Marsha Elder, Governor's Energy Office

Jim Johnson, Governor's Energy Office

Hank Erikson, Governor's Energy Office

Cecil Higgs, Department of Community Affairs

Lenwood Herron, Department of Community Affairs

Utilities and other energy suppliers

* G. J. Kordecki, Assistant Director, Conservation and Load Management, TECO

Glynn Hazelden, Superintendent of Operations, Peoples Gas System, Inc.

J. H. Williams, Jr., J. H. Williams Oil Company, Inc.

Business and Financial

Thomas L. Giddens, Senior Vice President, Freedom Savings

Edward J. Stankunas, Vice President, Residential Loans, Freedom Savings

* H. D. Cusick, Vice President, Community Affairs, Greater Tampa Chamber of Commerce

James A. Russell, Director Agency Relations, United Way of Greater Tampa, Inc.

David D. King, President, Tempair Mechanical, Inc.

Frank N. Copare, Vice President, Home Insulation Service

Public Interest

* Jan Abell, AIA, Local Community Design Center

Cathy Cicero, Hillsborough Environmental Coalition

* Reviewers

CASE STUDY INTERVIEWS

Buffalo
Des Moines
Jersey City
San Antonio
Tampa

REAL ESTATE RESEARCH (RERC) INTERVIEWS

Buffalo
Des Moines
San Antonio
Tampa
National Interviews

INTERVIEWS IN BUFFALO

Mayor James D. Griffin

*Thomas J. Murphy
Energy Coordinator
Office of the Mayor

Susan O'Connor
Director of Neighborhood Revitalization
Department of Community Development

Robert Roessler
Department of Community Development

Walter Kubisty
Buffalo Municipal Housing Authority

Robert O'Hara
Director of Buildings

Joseph F. Jones
Associate Superintendent
Buffalo Board of Education

James R. Militello
Director, Division of Economic Development

*John Garfield
Director, Energy Office
Erie County Department of Environment and Planning

Edward J. Rutkowski
County Executive
Erie County

Rodney W. Conrad
Office of Public Investment
Erie County Industrial Development Agency

Julian Dargan
Executive Director
Community Action Organization of Erie County, Incorporated

Marvin Mednick
Consumer Advisor
Niagara Mohawk Power Corporation

*Richard V. Deptula
Assistant Service Superintendent
Niagara Mohawk Power Corporation

Daniel J. Stefaniak
National Fuel Gas

Mark D. Pijacki
Supervisor, Research and Statistical Services
National Fuel Gas

Douglas Bradt
R. B. Newman Company

*Richard Coley
Buffalo Savings Bank

Anthony A. Marconi
Director of Community Development
Buffalo Savings Bank

*Gerald E. Kelly
Executive Vice President
Greater Buffalo Development Foundation

R. X. Hall
Director, Industrial Relations and Environmental Affairs
Buffalo Area Chamber of Commerce

*Arthur F. Worden, P.E.
Wilson, Klaes, Brucker and Worden, P.C.

David T. Stieglitz, Partner
Stieglitz, Stieglitz, Tries, Architects

David D. Taggesell

Joseph Hamilton
Director of Planning and Community Services
United Way of Buffalo and Erie County

*Kenneth E. Sherman
New York Public Interest Research Group, Inc.

John T. Moffitt
President, Buffalo Energy Project

*Robert Litzenburger
Buffalo Energy Project

William Nowak
Peoples' Power Coalition

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* Reviewed the draft case study.

INTERVIEWS IN DES MOINES

Mayor Peter Crivaro

Elaine Szmoniak
Des Moines City Council

Jerry Pecinovsky
City Manager's Office

*Robert Mickle
Director, City Plan and Zoning Commission

William E. Block
Senior Architect
City Plan and Zoning Commission

James M. Grant
Senior Architect
City Plan and Zoning Commission

*Barbara J. Ashton
Energy Resource Coordinator
Office of Neighborhood Development

Richard Wright
Director, Office of Neighborhood Devleopment

Lance Decker
Assistant Director of Neighborhood Conservation
Department of Urban Development

Tad Wideman
Director, Building Department

David Barnes
Executive Director
Capital View Housing Center

Edward J. Stanek
Chairman, Iowa Energy Policy Council

Patrick Lana
Weatherization Coordinator
Iowa Office of Planning and Programs

*E. E. Young
Vice President
Iowa Power

Roger Platten
Macmillan Oil Company, Incorporated

*Richard L. Bryan
President and Chairman of the Board
Des Moines Savings

Garland K. Carver
Executive Vice President
Iowa-Des Moines National Bank

William F. Landholt
Group Vice President
Real Estate Services
Iowa-Des Moines National Bank

Joan M. Crenshaw
Compliance Office
Iowa-Des Moines National Bank

Scott C. Wilson
Urban Affairs Associate
Greater Des Moines Chamber of Commerce

Thomas J. Van Hohn, P.E.
Brooks Borg and Skiles, [illegible]hitects and Engineers

George M. Mills
Mills Insulation Company

Linda Roberts
United Ways

Linda Wheaton
Director, Neighborhood Housing Services

*Martha Hock
Citizens United for Responsive Energy

*Craig Severance
Iowa Center for Local Self Reliance

Jean Williams
Chairperson, Advisory Committee on Environmental Quality

Robert King
Chairman, Central Advisory Board

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* Reviewed the draft case study.

INTERVIEWS IN JERSEY CITY

*Steven Miller
Office of the Mayor

*Sam Tsarinides
Department of Human Resources

Norman R. Walther
Program Director, Community
Development Block Grant Program

Dennis W. Ury, Jr.
Director of Neighborhood Preservation
Jersey City Redevelopment Agency

Karen Quinn
Office of the Mayor

Paul J. Byrne
Executive Director
Jersey City Economic Development Corporation

Wendy Wilson
Assistant Planner
Division of Planning
Office of the Mayor

John James
Director, Division of Facilities Maintenance
Department of Public Works

Ed Coleman
Assistant Administrator
Jersey City Housing Clinic -- Resource Center

Cathy Rubel
Energy Extension Service
Office of the Mayor

Paul Clemente
Chief of Maintenance and Operations
Jersey City Housing Authority

Peter de Pasquale
Director of Engineering
Jersey City Housing Authority

Frank E. Rehill
Area Manager, Governmental Affairs
Public Service Electric and Gas Company

L. P. Mingiello
Eagle Fuel Oil Company

*Harold A. Duncan
McConnell Fuel Oil Company

Joseph Scibetta
Chairman, Mayor's Subcommittee on
Energy Conservation in Small Business

Robert Kealy, Esq.

*Charles W. Lawrence
Executive Director
New Jersey Energy Research Institute

Elinora Watson
Urban League of Hudson County

*John S. Nettleton
Planner, Rick Cohen and Associates

Morris Slurzburg
Chairman, Mayor's Subcommittee on Energ
Conservation in Municipal Buildings

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* Reviewed the draft case study.

INTERVIEWS IN SAN ANTONIO

Mayor Lila Cockrell

*Lou Fox
Assistant City Manager

Shirl Thomas
Special Assistant
Office of the Mayor

*Roland Lozano
Director, Department of Planning

*Mary Flurry
Energy Management Coordinator
Department of Planning

Gary C. Gilbert
Department of Planning
Office of Energy Management

Rhea Korsh
Deputy Director
Department of Community Development

Rose Valdez
c/o Office of Energy Management
Department of Planning

Roger Ibarra
Supervisor, Public Utilities

Winnie Doria
Housing Resources Manager
San Antonio Development Agency

Kevin C. Moriarty
Assistant Director
Department of Human Resources and
Services

Edward O. Greff, Director of Development
San Antonio Housing Authority

Collas D. Smelser
Modernization Officer
San Antonio Housing Authority

Larry Morgan
Porgram Coordinator, Conservation Division
Texas Energy and Natural Resources
Advisory Council

John A. Geistweidt
Director, Economic Opportunity Division
Texas Department of Community Affairs

Ruben Garcia
Technical Assistance Specialist
Economic Opportunity Division
Texas Department of Community Affairs

Charley Jennings
Contract Manager
Home Energy Assistance Program, 518-A
Texas Department of Human Resources

David Frost
Alamo Area Council of Governments

*F. E. Jack Thornton
Superintendent, Consumer Affairs
City Public Service

Oran E. Park
Special Assistant for Research
City Public Service

Richard V. Gonzalez
Superintendent, Consumer Information
Customer Service Department
City Public Service

Glenn Biggs
Chairman, First National Bank

*William R. Sinkin
Chairman of the Board
Texas Bank

Lanny Sinkin
c/o William R. Sinkin
Texas Bank

Joe G. Reyes
Staff Manager
Greater San Antonio Chamber of Commerce

Boone Powell, AIA
Principal, Ford, Powell & Carson

William M. Hays, Jr.
Partner, The Marmon Mox Partnership

Barbara Banker
President, Williams Insulation

*Howard G. Rogers
Energy Consultant

*Mike Garcia
Mexican-American Unity Council

Beatrice Cortez
Community Organization for Public Service

Louise L. Cantwell
Administrative Director
San Antonio Conservation Society

Earl S. Doderer
Department of Engineering Science
Trinity University

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* Reviewed the draft case study.

INTERVIEWS IN TAMPA

Mayor Bob Martinez

Joan T. Smith
Director of Project Planning and Grants Administration
Bureau of City Planning

Sharon Russell
Division of Project Planning and Grants Administration
Bureau of City Planning

*Richard D. Garrity
Department of Public Works

Alton White
Executive Director
Tampa Housing Authority

*Ron Rotella
Director of Housing Inspections

*Renee T. Faass
Energy Conservation Coordinator
Department of Public Works

William C. Tatum
County Administrator
Hillsborough County

Donald H. Harwig
Director, Facilities Maintenance
Hillsborough County Courthouse

William B. Shirley
Energy Conservation Engineer
Hillsborough County

Sam Uccello
Director of Consumer Affairs
Hillsborough County

Dick Quinette
Consumer Investigator
Hillsborough County

Judy Geiger
Energy Extension Service
Hillsborough County Cooperative Extension Office

David Lee
Environmental Engineer I
Environmental Protection Commission

Joan M. Cappolino
District Program Specialist
Social and Economic Services
State of Florida District VI
Department of Health and Rehabilitation Services

Vicki Tschinkel
Secretary, Florida Department of Environmental Regulation

William Kennedy
Governor's Energy Office

Marsha Elder
Governor's Energy Office

Jim Johnson
Governor's Energy Office

Hank Erikson
Governor's Energy Office

Cecil Higgs
Florida Department of Community Affairs

Lenwood Herron
Florida Department of Community Affairs

Stanley Dormal
Hillsborough County Board of Education

Chris Maurici
Weatherization Coordinator
Hillsborough County Community Action Agency

*G. J. Kordecki
Assistant Director, Conservation and Load Management
Tampa Electric Company

Glynn Hazelden
Superintendent of Operations
Peoples Gas System

J. H. Williams, Jr.
J. H. Williams Oil Company, Incorporated

Edward J. Stankunas
Vice President -- Residential Loans
Freedom Savings

Thomas L. Giddens
Senior Vice President
Freedom Savings

*H. D. Cusick
Greater Tampa Chamber of Commerce

James A. Russell
Director, Agency Relations
United Way of Greater Tampa, Incorporated

David D. King, P.E.
President, Tempair Mechanical, Incorporated

Frank N. Copare
Vice President
Home Insulation Service

*Jan M. Abell, AIA

Sally Thompson
Chairperson, Hillsborough Environmental Coalition
Department of Public Works

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* Reviewed the draft case study.

RERC

INTERVIEWS

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President
Adam, Meldrin & Anderson
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Berlin, John
President
Buffalo BOMA
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Berlow, Sheldon
President
Berlow Real Estate
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Amherst, New York 14226

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Assistant Secretary: Director
of Community Development
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Buffalo, New York 14203

Cunningham, Walter
General Manager
Central Buffalo Project Corp.
2102 Liberty Bank Building
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Director
Property Management Department
Marine Midland Bank
1 Marine Midland Center
Buffalo, New York

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Stove, Roff & Herman
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American Restoration Co.
141 Elm Street
Buffalo, New York

Janulionis, Edward
President
Adaptive Rehab Associates
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Partner
Berlow Real Estate
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American Restoration Co.
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Assistant Vice President
Commercial Real Estate Financing
Manufacturers And Traders Trust Co.
1 M&T Plaza
Buffalo, New York 14240
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Tonawanda, New York
(716) 874-6010

Reeves, Donald J.
308 Summer Street
Buffalo, New York 14222
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Sweeney, James Sr.
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Teach, John
Teach Agency, Inc.
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Turnbull, Terry
Banking Officer
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Executive Director
Lower West Side Resource and
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266 West Tupper Street
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Zugger, Robert
Manager
Statler Hotel
Buffalo, New York
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RERC
INTERVIEWS

Des Moines

Clarke, Lloyd E.
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Omega Ltd.
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Iowa Realty
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Eichman, John
Assistant Vice President
Iowa Des Moines National Bank
Financial Center Building
7th and Walnut
Des Moines, Iowa 50307
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Graham, John
President
Graham Realty
811 Grand Avenue
Des Moines, Iowa

Gussio, Ellie
Director
Home Inc.
857 17th Street
Des Moines, Iowa 50314

Hubbell, James III
Vice President
Hubbell Realty
205 Hubbell Building
Des Moines, Iowa 50309
(515) 243-3228

Levengood, John
Stanbrough Realty
3111 Douglas Street
Des Moines, Iowa 50310

LoFredo, Teresa
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Des Moines, Iowa 50310

Masteller, Jack
Manager
Hotel Fort Des Moines
10th and Walnut
Des Moines, Iowa 50309
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Olsen, Clark
Senior Regional Administrator
Commercial Mortgages
Bankers Life
Des Moines, Iowa 50307
(515) 247-5111

Rasmussen, Sandra
Mid-Iowa Management Co.
323 Stephens Building
Des Moines, Iowa 50309

Rumbly, Nolan
Vice President
American Federal Savings & Loan
601 Grand Avenue
Des Moines, Iowa 50307

Ruby, George
Director
Facilities Operation and Planning
Meredith Corp.
1716 Locust Street
Des Moines, Iowa 50336

Schmidt, George
Chief Engineer
Ruan Center
666 Grand Avenue
Des Moines, Iowa 50307

Thomas, Don
Vice President
Shaw, Steve
Engineer
Younkers Department Store
7th and Walnut
Des Moines, Iowa
(515) 247-7119

Thompson, James
Director
Traffic and Transportation
Skywalks/Office Special Project
City Hall
City of Des Moines
East 1st and Locust
Des Moines, Iowa
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Wood, Larry
Preferred Management Co.
815 Office Park Road
West Des Moines, Iowa 50265

RERC
INTERVIEWS

San Antonio

Barshop, Samuel
President
La Quinta Motor Inns
84 N.E. Loop 410
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San Antonio, Texas

Birnbaum, Mike
Trammell Crow Company
4957 Walzim Road
San Antonio, Texas 78318

Crouch, Chris
Vice President
Real Estate Division
National Bank of Commerce
P.O. Box 121
San Antonio, Texas 78291

DeMent, Mike
President
Jim DeMent Properties
9000 Tesoro Drive
San Antonio, Texas 78216

Embrey, Walter
President
Embrey Investments, Inc.
7475 Callaghan Road
San Antonio, Texas 78229

Gribble, Mike
Vice President
Henry S. Miller
8918 Tesoro Drive
San Antonio, Texas

Kyse, Russell
President
Routh and Co.
401 Cypress Tower
San Antonio, Texas 78212

Melson, Bill
Hendry Investments
8700 Crown Hill Boulevard
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Noack, Lynn A.
Vice President
Ray Ellison Homes
4800 Fredericksburg Road
San Antonio, Texas 78201

Reneau, Donald
R.C. Management Inc.
4702 West Avenue
San Antonio, Texas

Sinken, William
Chairman of the Board
Texas Bank
8111 South W.W. White Road
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Solcher, Gerri
Executive Vice President
San Antonio Savings Bank
111 Soledad Street
San Antonio, Texas 78205

Turner, Bob
Mitchell, Battross Properties
7400 Blanco Road
San Antonio, Texas

RERC
NATIONAL
INTERVIEWS*

Bergstrom, Kelly
JMB Property Management Corporation
Chicago, Illinois

Bul, Alex
Henry S. Miller Company
Dallas, Texas

Butler, Al
Trammell Crow Company
Dallas, Texas

Carnavale, Len
Prudential Insurance Company
Chicago, Illinois

Cameron, Sandy
JMB Property Management Corporation
Chicago, Illinois

Cleary, Martin
Teachers Insurance and Annuity
Association
New York, New York

Condon, Edward
Equitable Life Assurance Society
New York, New York

Davis, Don
Prudential Insurance Company
Newark, New Jersey

Dominek, Rod
Aetna Life & Casualty Company
Hartford, Connecticut

Eisenberg, Leonard
Arthur Rubloff and Company
Chicago, Illinois

Green, Larry
Sears, Roebuck & Company
Chicago, Illinois

Grey, Alan
Balcor
Skokie, Illinois

Hanson, Kenneth
Romanek-Golub and Company
Chicago, Illinois

Holloway, Ben
Equitable Life Assurance Society
New York, New York

Kleine, Doug
Community Association Institute
Roanoke, Virginia
(Condominium Owners Association)

Kroner, Gus
Trammell Crow Company
Dallas, Texas

Lancaster, Joseph
Henry S. Miller Company
Dallas, Texas

Levinson, Alan
Metropolitan Structures, Inc.
Chicago, Illinois

Miller, Robert
Robert McNeil Corporation
San Mateo, California

Morley, Mae Lyn
Prudential Insurance Company
Chicago, Illinois

Norber, Eugene
DeBartolo Corporation
Youngstown, Ohio

Pusker, George
Equitable Life Assurance Society
New York, New York

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*Interviews by Real Estate Research Corporation with owners of nationwide holdings in real estate. Although not related to the case studies per se this list is included for completeness.

Rebholtz, Arnold
Prudential Insurance Company
Newark, New Jersey

Sheridan, Donald
L.J. Sheridan and Company
Chicago, Illinois

Smith, Dr. Al
Energy Technical Center
American Hotel & Motel Association
San Antonio, Texas

Smith, Hugh
Radisson Corporation
Minneapolis, Minnesota

Smolenski, John
Baird and Warner, Inc.
Chicago, Illinois

Solomon, Michael
National Apartment Owners Association
Washington, D.C.

Studley, Julien J.
Julien J. Studley, Inc.
New York, New York

Viltoft, Jordon
Radisson Corporation
Minneapolis, Minnesota